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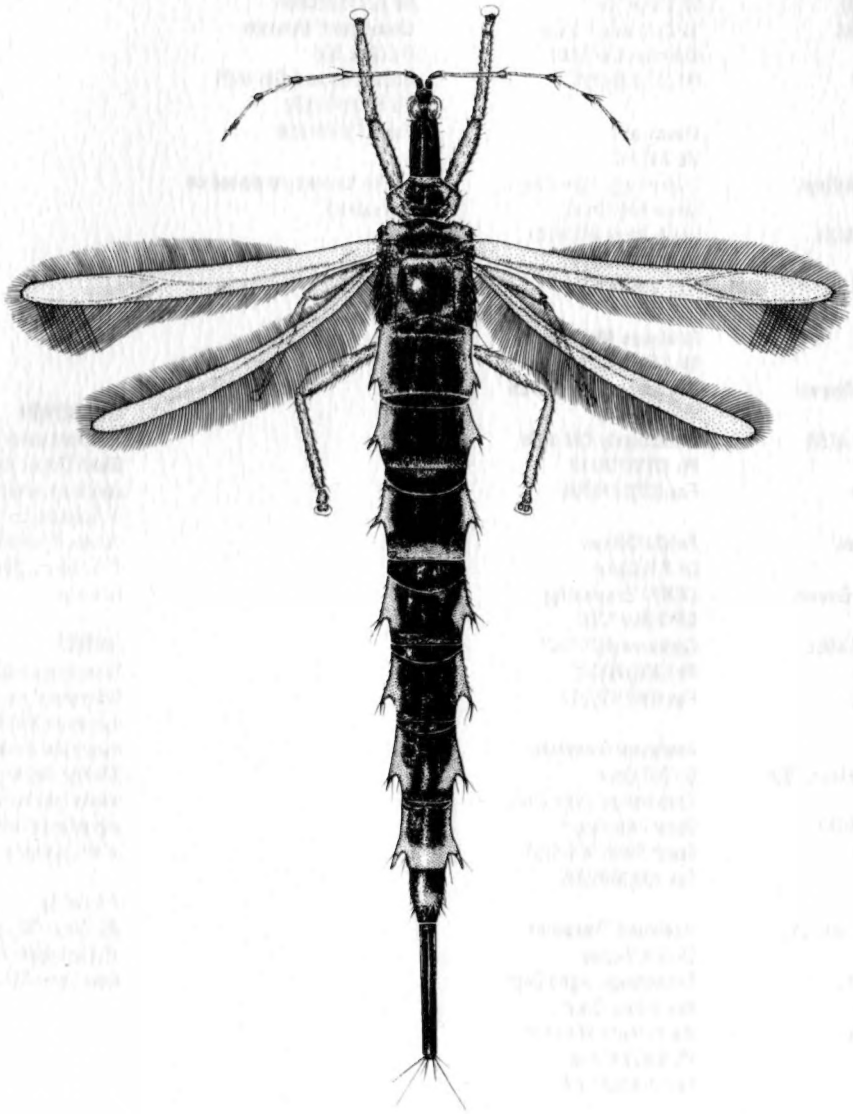

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(Office Bearers continued on rear cover)

THE COVER
The front cover shows the Giant Thrips, *Idolothrips spectrum*, which is widespread in Australia on dead eucalypt leaves. Illustration by Geoff Thompson, Queensland Museum.

NOTICE
Statements made in "Myrmecia" do not necessarily represent the views of the Australian Entomological Society. Items printed herein should not be referred to or reproduced without permission of the author of the material.

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MYRMECIA

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Myrmecia Advertising Rates

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These rates apply to camera ready copy supplied by the advertiser. Where this is not supplied a small additional charge may be made for preparation of the layout. In addition, loose inserts supplied by the advertiser will be included for $50 per enclosure. These should be of a size which will not project beyond the pages of "Myrmecia".

Editorial — Society Anniversary Coming Up

Next year the Society will be 25 years ago, something we can all celebrate because the Society has really come of age as an active, professional and influential body in recent years. The perceptive among you may notice that next year's conference, announced in this issue, will be the 21st AGM. How come, I hear you ask, is a 25 year old society only just having its 21st Annual General Meeting? Consider the dates:

Society formed — 17 August 1965 (at Hobart ANZAAS) **1AGM** — Melbourne, Vic. 15 Jan 1967 **2AGM** — Armidale, NSW. 9 Feb 1968 **3AGM**— Victor Harbour, SA. 16 Aug '69 **Scientific meeting only**, Port Moresby ANZAAS,17 Aug 1970 **4AGM** — Southport, Qld. 23 May 1971 **5AGM** — Canberra, ACT. 28 Aug 1972 (no scientific meeting) **6AGM** — Quindanning, WA. 12 Aug 1973 **7AGM** — Canberra, ACT. 18 Jan 1975 **8AGM** — Hobart, Tas. 8 May 1976 **9AGM** — Melbourne, Vic. 25 Aug 1977 **10AGM** — Sydney, NSW. 10-13 Jan 1979 **11AGM** — Lyndoch, SA. 10 May 1980 **12AGM** — Surfair, Qld. 9 May 1981 **13AGM** — Canberra, ACT. 8 May 1982 **14AGM** — Armidale, NSW. 16 May 1983 **15AGM** — Mildura, NSW. 13 May 1984 **16AGM** — Hobart, Tas. 27 May 1985 **17AGM** — Tanunda, SA. 12 May 1986 **18AGM** — Perth, WA. 16 Aug 1987 **19AGM** — Brisbane, Qld. 15 May 1988 **20AGM** — Sydney, NSW. 4 May 1989 **21AGM** — Canberra, ACT June/ July 1990

Thus there were no AGMs in 1970, 1974 and 1978. Sometimes this was because the ANZAAS conferences, with which AES Conferences used to be closely linked, were held overseas in NZ or NG. Though in 1970 a scientific meeting and excursion of AES were oganised, without a formal AGM, by Society members at the Port Moresby ANZAAS. Another anomaly occurred in 1972 when a business AGM, without a scientific meeting, was held during the International Congress of Entomology in Canberra. So in fact we have three anniversaries next year: 25th birthday, 21st AGM and 20th Australian scientific meeting! By the way, who holds the record for attending AGMs?? I've made it to 10 but there must be a few of you who have beaten 15. Let me know if you think you might be a record holder.

GEOFF MONTEITH
Myrmecia Editor

Copy Deadline for Next Issue

Material for publication in the November issue of "Myrmecia" should be in the hands of the Editor, Geoff Monteith, at his address on the inside of the front cover by **Friday, October 20**. Fax transmission may be used to (07)8461918 but care should be taken to ensure legibility.

Executive Quarterly Report

MEETINGS

The Executive met on June 15 and July 17, 1989.

MEMBERSHIP

The Executive accepted 13 nominations for membership and elected 19 new members. The distribution of members is as follows:

QLD	170	WA	44
NSW	158	TAS	26
ACT	118	NT	14
VIC	98	O/S	57
SA	67	ADDRESS UNKNOWN	4

Membership by categories is:

Full	579	Honorary	6
Student	88	Joint	22
Retired	61	TOTAL	756

WHERE ARE THEY?

Mail has been returned from the following members. Does anyone know their new addresses?
Mr W.M. Doherty (QLD)
Dr W.A. Palmer (O/S)

NEW MEMBERS

WE WELCOME THE FOLLOWING NEW MEMBERS: Elected June 15, 1989

Prof. R.A. Beaver, MA, DPhil (Oxon), School of Pure and Applied Sciences, University of the South Pacific, Box 1168, Suva, Fiji. Roger is head of the Biology Department and has entomological experience in Europe, South America, South East Asia and Africa as well as the Pacific region. His broad interests include the biology of insects in ephemeral habitats and systematics of bark and ambrosia beetles.

Mr S. Ellis, C/- Transworld Butterfly Company, Apartado 6951, 1000 - San Jose, Costa Rica, Central America. Simon's interest in butterflies includes collecting, breeding and exchanging as well as buying and selling. He is also involved in entomological tours for collecting or photography.

Mrs L.C.P. Fernando, BSc (Agric) (Hons), Department of Entomology, University of Queensland, St Lucia, QLD 4067. Priyanthie is a post-graduate student interested in pest management, especially host-parasitoid interactions and parasitoid behaviour.

Ms J.H. Fisk, BSc (Hons), CSIRO, Division of Entomology, GPO Box 1700, Canberra, ACT 2601. Jennifer is a technical officer at CSIRO studying part-time for her Master of Science degree. She is interested in insecticide resistance and the cytology of *Helicoverpa* spp.

Miss F. Fitzgibbon, BSc, Waite Agricultural Institute, Private Bag No. 1, Glen Osmond, SA 5064. Frances is interested in photography and insect collecting generally. She is currently studying the woolly apple aphid and its parasite.

Mr J.H. Hawking, BAppSci, 13 Amaroo Crescent, Wodonga, VIC 3690. John is curator at the Murray Darling Freshwater Research Centre. His interests include the ecology and life histories of the Odonata and aquatic Pyralidae.

Ms J. Jackson, BSc (Hons), Department of Zoology, University of Tasmania, GPO Box 252c, Hobart, TAS 7001. Jean is working with freshwater insects for her PhD thesis. She is particularly interested in the systematics, ecology and biogeography of the Trichoptera.

Dr E. Lees, BSc, PhD (Lond), Department of Agricultural Chemistry, University of Sydney, NSW 2006. Edith is Senior Lecturer in Agricultural Chemistry and is interested in the biochemistry of insecticide resistance in grain storage pests.

Dr K.S. Lefevere, PhD, Department Zoology, Monash University, Clayton, VIC 3168. Kathelijne is a post-doctoral research officer in insect physiology. She is especially interested in insect endocrinology relating to diapause and reproduction.

Rev. A.R. Lormer, 2/13-15 Carnarvon Street, Carlton, NSW 2218. Rev. Arthur Lormer is a retired minister of religion who is a voluntary worker in the Entomology Department of the Australian Museum. He is working on the taxonomy of the Scarabaeidae and has additional interests in fossil insects and the Ephemeroptera.

Mr R. Lowe, BSc, PO Box 365, Hurstbridge, VIC 3099. Roger is an honours student at LaTrobe University. He is investigating control of pea weevil in field peas.

Mr W.M. Woods, BSc (Agric), Entomology Branch, Department of Agriculture, Baron-Hay Court, South Perth, WA 6151. Bill is an entomologist with wide experience in the biological control of insects and weeds. He is currently working in horticultural entomology.

Mr M. Yare, BSc, Department of Entomology, University of Queensland, St Lucia, QLD 4067. Michael is an honours student studying the systematics of Embioptera.

Elected July 17, 1989

Mr H.M.J. Bandara, BSc (Agric), Department of Entomology, Queensland University, St Lucia, QLD 4067. Herath is investigating behavioural aspects of fruit fly for his Diploma of Agricultural Studies.

Mr R.J. Corcoran, BAppSc, 6 Cooradilla Street, Jindalee, Brisbane, QLD 4074. Robert is a senior technician in the Department of Primary Industries. He has 20 years experience in economic entomology.

Mr S. Permkam, BSc (Agric), 3/257 Hawken Drive, St Lucia, QLD 4067. Surakrai is a Master of Science student with a special interest in the taxonomy of a group of tephritid flies. He also has experience in biological control.

Mrs K. Rungrojwanich, BSc (Agric), Department of Entomology University of Queensland, St Lucia, QLD 4067. Krisana is a postgraduate student interested in the use of natural products for insect control.

Dr P.J. Suter, BSc (Hons), PhD, State Water Laboratory, Engineering and Water Supply Department, PMB Salisbury PO, Salisbury, SA 5108. Phillip is a biologist with an interest in stream ecology and the Ephemeroptera in particular.

Miss R.L. Whyte, BAppSc, 18 Aldebaran Street, Inala, QLD 4077. Raelee is currently studying wingless cockroaches (Calolampra) for her Master of Applied Science degree.

CHANGES OF ADDRESS OR TITLE

Dr E.J. Brough, Entomology Branch DPI, Meiers Road, Indooroopilly, QLD 4068 (QLD).

Ms J.K. Davidson, Department of Genetics, Kings Buildings, University of Edinburgh, West Mains Road, Edinburgh, EH9 EJN UK (VIC).

Mr J.G. Gellatley, RMB 8105, Matcham Road, Matcham, NSW 2250 (NSW).

Mr T.A. Heard, Entomology Branch DPI, Meiers Road, Indooroopilly, QLD 4068 (QLD).

Mr M.J. Hockey, PO Box 4764, Darwin, NT 0801 (QLD).

Ms M.A. Kleinig, Box 9, Laura, SA 5480 (SA).

Dr K.A. Lyonns, formerly Ms.

Mr A.H. O'Toole, 64 Grattan Street, Carlton, VIC 3053 (VIC).

Dr G.H.L. Rothschild, Director, Australian Centre for International Agricultural Research, GPO Box 1571, Canberra, ACT 2601 (ACT).

Mr J. Van Schagen, Entomology Branch, Department of Agriculture, Baron-Hay Court, South Perth, WA 6151 (WA).

Dr G.C. Webb, 109 Barton Terrace, North Adelaide, SA 5006 (ACT).

Mr L. Wilkie, Zoology Department, James Cook University, Townsville, QLD 4814 (QLD).

Mr P.J. Wilson, 60/500 Elizabeth Street, Surrey Hills, NSW 2010 (NSW)

FROM THE MINUTES

Promoting the Society

At the recent AGM in Sydney a meeting of the Executive and interested members finalised details of the Marketing/ Promotions Committee. The proposal was passed unanimously at the 38th Council Meeting.

The Committee comprises Dr Ian Galloway (Convenor), Dr Neil Heather (Chief Editor), Mr John Donaldson (Business Manager) and Drs Ross Wylie and Paul McFadyen (Committee members). The Committee has a broad charter to explore avenues which will promote the Society and its saleable products and has launched itself enthusiastically into the task.

Vale

The Executive recorded with regret the passing of Dr Noel Richardson.

Student Concession

Students are reminded that the Society offers a student concession on its subscription fees. If you are a full-time student and you have paid your 1989 subscription without taking advantage of the concession rates, contact the Secretary.

Members who nominate students for membership should remember to advise the nominee to fill out a concession form as well as the nomination form.

SOCIETY LETTERCARDS FOR SALE

The Society has produced two, quality lettercards based on prize-winning drawings from the annual illustration competition. They are obtainable from the Business Manager: ten for $4.00 or two for $1.00.
Postage for ten is $0.95 within Qld and $1.05 for other states.
Postage for two is $0.37.

The A.R.Woodhill Memorial Address

Delivered by Associate Professor F.J.D. McDonald to the 20th Annual Conference of the Australian Entomological Society, Sydney, May 1989.

A. R. Woodhill

Anthony Reeve Woodhill, lecturer in entomology at the University of Sydney for 35 years from 1930 to 1965.

INSECTS IN PERSPECTIVE

Having taught the subject of Entomology for something like 23 years I thought it might be appropriate to consider insects from a teaching perspective. In doing so I thought it might also be appropriate to pay tribute to my predecessor Dr Anthony Reeve Woodhill, the McCaughey Lecturer in

Entomology at The University at Sydney for 35 years. I had unfortunately never met Tony Woodhill during his lifetime and am grateful to some of his students whom I personally contacted for information used in this talk. I have also used three obituaries written by D.J. Lee and D.F. Waterhouse (1968), G. Pasfield (1965), and K.E.W. Salter (1965) for information on his career and teaching.

Tony Woodhill was trained in Entomology at The University of Sydney by Walter W. Froggatt and A.J. Nicholson and graduated with Distinction in 1924. He was intensely interested in insects and on graduation joined the Department of Agriculture as the first graduate entomologist. Here he worked on blowflies and dicky rice weevil and many other pests of commercial crops at that time. This period of his career had a profound influence on his teaching as shown by the great emphasis he placed on what was popularly termed "the bionomics of the species".

Woodhill was appointed McCaughey Lecturer in Entomology on retirement of his predecessor, A.J. Nickles, in 1930. The position, however, moved from the Faculty of Agriculture to the Department of Zoology at the insistence of the then Professor of Zoology, W.J. Dakin. This was sensible since it placed the discipline firmly in the proper context of the animal kingdom. Woodhill taught Entomology on a broad basis with some emphasis on insect physiology which at that time was going through a period of vast expansion and development. An honours course was initiated and students could major in Entomology both in Agriculture and Science. There is no doubt from all my conversations with his previous students that he could never be described as a scintillating lecturer. However, Lee and Waterhouse have this to say of his lectures: 'Woodhill's success lay in his careful preparation of lectures and practical courses. "Careful" must be emphasized, for what he lacked in colourful presentation was more than counterbalanced by his unfaltering delivery of all the information he imparted with professional dignity. He just never stumbled, never forgot a detail nor omitted a pertinent fact.' He must have been an able teacher indeed for if one examined the Who's Who of Entomology for 1930-60 we find his graduates at the top of the tree in all the major institutions employing entomologists, CSIRO, Departments of Agriculture, Universities, Museums, and even industry. Certainly today I don't believe there is any single institution teaching Entomology with such an enviable track record. One has to remember that he was the only teacher of entomology in those days at the University of Sydney.

Woodhill's personal influence was greatest in his honours course. In this he did not teach but provided guidance and example. He had a habit of asking his students to convince him that they were right in their arguments. A student who could convince him had every reason to be confident in his ideas.

He took Sabbatical leave in 1939 to work with V.B. Wigglesworth. He was accepted as a commissioned officer in 1941 after the outbreak of World War II. As a member of the armed services he undertook teaching and research on mosquitoes. He published a number of papers on this period of research. On return from the war in 1945 he returned to The University of Sydney. He was awarded the DSc degree in May 1951 for studies in the biology and systematics of Australian mosquitoes and was promoted to Reader in 1953.

His students remember him as a tall, handsome, well dressed man with umbrella and hat. He was nicknamed the "Count". It is recorded that after the war the hat disappeared and the umbrella was not always present. There is no doubt that he was a very formal sort of man and dealt with his students in a kindly but formal way, which was not unusual for academics of that time. He was obviously a retiring and self-effacing man not out to win glory and honour for himself or his discipline. In other words, a scholar and a gentleman. This probably accounts for the fact that Entomology did not expand in the same way that other subjects did in the 1960's. He also suffered a severe heart attack in 1956 from which he recovered but he never fully regained his former vigour.

He was always greatly concerned about his students' appearance and Faith Evans recounts that when she was a student in the 1930's living on 15/- a week, he commented on how badly dressed the woman students were. He would certainly be horrified by student attire today.

I believe one can sum up Tony Woodhill's achievements in words written by Gordon Pasfield in his obituary. The common bond between all of his former students and colleagues was the high regard they had for this unassuming, sincere and kind man whose loyalty was a byword amongst them and who was so quietly proud of any and all of their achievements.

Thirty years ago to study entomology generally meant that the student had a thorough grounding in insect

taxonomy and a good knowledge of insect ecology, physiology and toxicology. Today I fear that the term is used in a much broader sense to include many people working with insects rather than knowing very much about them *per se*.

Insects are such wonderful laboratory animals that they have been used in research for all sorts of disciplines other than entomology. The amount of knowledge on insects is now so vast that a student can only hope to come in contact with a small fraction of this knowledge in the 3-4 years he spends in a University. I believe as teachers we can now no longer hope to train students in all aspects of entomology. In order to equip students to cope with the modern world they must have basic grounding in biochemistry, computing, genetics, biology etc. etc., leaving less and less time for the insects themselves. Their knowledge will now come after they have graduated and are working in a specialized field. The subject that tends to be displaced more and more is unfortunately the taxonomy of insects. There are two reasons for this: it is no longer a fashionable subject for study and secondly so much bad taxonomy had been done in the past that it has put the discipline into disrepute.

George Ball, my former supervisor, a great trainer of taxonomists, has suggested that to train as taxonomists students ought to have expertise in some 13 different subjects all pertinent to taxonomy. These included:

1. Scientific reasoning and history and philosophy of science.
2. Principles and methods of automated data processing.
3. Systematic theory.
4. Literature of systematic biology.
5. Insect morphology and taxonomic diversity. This area of study is basic to all other work in systematic entomology.
6. Character systems.
7. Applied Entomology.
8. The temporal dimension. This includes a study of palaeontology.
9. The spatial dimension. Principles of geographic distribution of organisms are vital in understanding taxa and their histories and relationships. This also includes the study of Zoogeography.
10. Zoological nomenclature.
11. Field work. The student of systematic entomology must think of the organisms that he studies as parts of living systems. Too often taxonomy is regarded as a science involved with dried pinned insects only. This is totally erroneous.
12. Curatorial work. Students should be familiar with the problems and methods of collections management. Too often collections are ruined through bad or no curation. This was so true of the Macleay insect collections at Sydney University until recently.
13. Communication. A student must have the opportunity to learn and practice the skills of oral and written presentations. This is all too true of today's students who have, by and large, very poor skills in writing and even less in oral skills.

There is no way in our present system of tertiary education that I could possibly hope to introduce students to this range of training. How much do we do? A smattering of about 6 of those subject areas would be the answer. I have one year in the Faculty of Agriculture and eighteen months in Science to train students not only in the basic tenets of entomology but to add the necessary skills I have mentioned to make a good all round student into a taxonomist. There is no doubt that in the American system, where students are trained in their postgraduate years, this is possible. In our system where postgraduate training is mainly by research and thesis this is not possible. There are some changes however. Recently Masters by coursework degrees are being introduced into most universities. It may thus be possible in the future to give students the training they need in taxonomy at this level. However, few institutions if any in Australia would have the staff to mount the wide range of courses necessary for this type of programme in taxonomy.

Nowadays the comprehensive teacher of entomology, or for that matter of any science discipline, has disappeared. The teachers of today are specialists in some particular aspect of the discipline. They no longer command the wide areas of knowledge that was once possible due to the enormous expansion of knowledge in the last 40 years or so. No longer does the professor dazzle introductory students with his oratory and a broad vista of the subject taught, thereby encouraging them to specialize in this subject. Students these days hit specialization almost from the day they enter university. They rarely get the general

principles of the subject in question. This is especially true for entomology where less and less general taxonomy of the Insecta is being taught. Students are simply not aware of the diversity of the insect world but probably know a great deal about the genetic mechanisms or cellular mechanisms operating in the insect.

The other problem today is the fact that students are not in the game of University Education to gain knowledge for its sake alone, they are there to get a training which will lead to a job at the end of it. Not only a job but a well-paid one at that. Students are well aware of the job opportunities in the various discipline areas and they are well aware of the pay packets associated with them. There are today few jobs available in entomology in Australia and the pay is not very good. This is true for most scientific jobs today. There is also a general perception amongst the public that because we seem to be wrecking our environment at a great rate, this has somehow something to do with what scientists have been doing. There is thus a distinct downward trend in science teaching and indeed, in the numbers of students enrolling in pure science. Entomology is of course part of that trend.

At the same time there has been a great surge forward in the use of biological control methods and in integrated control methods, both resulting in a reaction to the over-use of pesticides. Again one can say science provided the tools but these were misused by the general public and science gets the blame. However, in order to use biocontrol methods for insect control we must have entomologists trained in general principles. They must have a sound grasp of insect taxonomy, life systems, ecology, etc. It is essential that we continue wherever possible to provide students with these basic skills. However I am afraid the system is against us. Today the name of the game is whether your course has the student numbers and whether your research is of relevance to the national interests, whatever they are. Courses with small numbers of students will in the future simply not be funded adequately, and will ultimately have to close down. Esoteric interests in research will simply not be catered for. All too often taxonomic teaching and research falls in this category. There is simply no point in training large numbers of students in taxonomy in Australia, there are but few jobs. Very few of the graduates from my department in taxonomy actually get or have a job in insect taxonomy. I have no option but to strongly advise students to major in some other area of entomology.

This brings me round to the other aspect of my talk, who will in fact carry out taxonomic research in the foreseeable future? There is no doubt that at the moment the number of active professional taxonomists in Australia is on the decline. There is a tremendous need for people to simply identify species of insects, indeed much of a professional taxonomists time is taken up with insect identification. The only way that taxonomic research will be expanded will be ,I believe, through the work of amateur entomologists. The term amateur has unfortunate connotations, often used to mean without professional finish or a dabbler in the field. The word actually comes from the Latin *amare* to love. Janice Matthews (1988) published the results of a survey she conducted in the US into amateur entomologists. I believe what she has to say is probably just as applicable to the Australian scene. It is apparent that amateurs are fairly evenly distributed over all age groups. Some became interested in insects as children, others in later life.

A striking finding of the survey was the extent to which amateurs enthusiastically share entomology with children, and the public at large. Most amateurs are involved in several amateur scientific societies. Very few of her respondents reported regular interaction with paid entomologists. Why is this so?

First, the professional is probably also a victim of stereotyping, they are often perceived as ivory tower recluses. Almost all amateurs urged the professional to increase his or her interaction with non scientists.

Second, in their interactions with professionals most amateurs reported mixed receptions. Their perception is that many professionals are ill at ease with, if not cool or hostile toward adult amateurs. I believe that by and large here in Australia our relations with amateurs are probably quite good, but that there is room for improvement. My memories of the Entomological Society of Queensland are that there were a large number of amateurs who were both members and participants at meetings. However, I believe this has changed in recent years. Our Society here in Sydney tries hard, but we have a very poor level of interaction with amateurs.

What do amateurs do for a living? The adult amateur's primary employment was, in 36% of cases, in sciences and mathematics. Often these people had a scientific background of equal strength to a professional entomologist,

but in a related field. Several had published in entomology or other biological areas. Another 17% were employed in education: teachers, park rangers and related jobs. Slightly less than 28% were in service occupations in which the biological sciences do not play a major role.

It is probable that this figure is a little low since the service occupations play a major role in our society today. About 19% were employed in miscellaneous occupations, farmers, retired woodworker, candy wholesaler, etc.

If you compare these occupations to the major employment patterns of paid entomologists in research, in science, teaching, university and college students, and employment in service occupations such as pest control, it is clear that the backgrounds and the current occupations of amateur entomologists are far more similar to those of the professional entomologists, at least in the US, than common stereotypes would lead one to believe. I am convinced much the same holds true here in Australia. The disheartening fact is that most of these people were not influenced to take up their interest by professional entomologists. A great many studies have firmly established the fact that interest in science drops as children progress through school particularly in high school years, fuelled by academic experiences and by peer pressure. What happens to those who remain interested but who do not go on to become paid professionals? Amongst amateur entomologists, continuing interest in entomology rarely flourishes because of contact with a teacher of entomology, or professional entomologists. Rather it is nurtured by other amateur entomologists, either within their own family or amongst acquaintances. Unfortunately today science has taken on the aura of unexplained mystery available only to the initiated elite. We must somehow attempt to take science and entomology back to the people. There are some signs that this is happening. Informed TV programmes are a good example. There have been several informative TV entomological programmes over the last few years. It is important we foster this type of programme. It is also important that we support our entomological societies and field naturalist clubs for it is here that we will foster outside interest in our discipline.

I believe as far as taxonomic research is concerned we should foster non professionals' interest in this area as much as possible. It is incumbent on we professional taxonomists to help and guide amateur taxonomy without being too patronising in our efforts to do so. A great deal of excellent taxonomic research has been done by so called amateurs and a great deal more can be done. In fact, I believe that until the tide in academic and other institutions turns back to favour taxonomy, we will have to rely more and more on these people to cope with our ever mounting need for taxonomic research in Australia.

As for the teaching of taxonomy in the academic sphere. I believe there will be a resurgence of interest in this discipline, albeit a slow one. There is no doubt that the "in subject" of today becomes the discarded subject of tomorrow. There will be a growing demand for trained personnel to cope with the naming of insect species, and the training institutions will have to respond to this demand. There is no doubt that the well paid professions and jobs will become saturated, supply will exceed demand and students will return to the purely science orientated jobs, including entomology and hopefully taxonomy as well.

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Regional News

QUEENSLAND
SOUTH EAST QUEENSLAND

Lands Department, Alan Fletcher Research Station

Rachel McFadyen and Allan Tomley attended the Fifth Biennial Noxious Plants Conference at Lismore, conducted by the NSW Department of Agriculture and Fisheries on 17-21 July. They delivered papers on the biocontrol of annual ragweed and groundsel bush, respectively.

Forestry Department

Brenton Peters supervised the fumigation of 2 buildings in Brisbane to eradicate the West Indian drywood termite, *Cryptotermes brevis*. The old Queensland Museum building required 10,600 square metres of reinforced PVC sheeting to form a gas tight cover before introducing 3.3 tonnes of methyl bromide into the 56,000 cubic metres of space. This is the largest fumigation yet undertaken in the eradication program. The other building was the Queensland University of Technology which required 1.4 tonnes of gas. Despite strong winds and many other problems both jobs were successfully concluded.

Queensland Institute of Medical Research

Brian Kay has just completed a WHO consultancy in Vietnam. Brian spent 4 weeks in Hanoi teaching a vector biology and control course. He also assisted in the running of an international quarantine course in Ho Chi Minh city.

University of Queensland

Hugh Paterson discussed *Anopheles* cytotaxonomy with Chris Green in Thailand on his return from the "International Symposium on Fundamental Problems of Evolutionary Biology" held in Moscow.

Martin Rice attended the Australian Institute of Agricultural Science meeting on overseas aid held in Darwin and gave a presentation on neem. Professor Heinrich Schmutterer from the University of Giessen, West Germany, visited the department to hold discussions with Martin on the world development of safe pesticides using neem.

Joan Bryan and Des Foley spent several months collecting members of the *Anopheles punctulatus* complex in the Solomon Islands and PNG. Des returned in time to teach electrophoresis to Mr Bernard Bakotee from the Solomon Islands Malaria Training and Research Centre.

Scott O'Neill submitted his PhD thesis entitled "Symbiont Induced Sterility in Insects". Scott and wife Julie are off to the US and Europe for a well earned holiday.

Leonie Whitford has recently submitted her MAgSc thesis on the introduced chrysomelid, *Zygogramma bicolorata*. Also, Ioane Aloalii completed his MAgSt on cardiac glycosides of *Danaus plexippus*. Ioane is at CSIRO Long Pocket for 3 months work experience before he returns to Western Samoa.

Christine Neale is forging ahead with her MSc thesis on Specific Mate Recognition Signals in *Dacus tryoni* and *D. neohumeralis* and should be finished very soon.

Queensland Museum

An antipodean convergence of Queensland Museum arachnologists is taking place in Turku, Finland, on August 7-12 when Robert Raven, Val Davies and Tracey Churchill arrive by different routes for the International Congress of Arachnology. All are presenting papers. Robert also caught the meeting of the American Entomological Society in Indianapolis in June on his way to spend a couple of weeks at the American Museum of Natural History before heading on to the UK and Europe.

CSIRO, Long Pocket

Dr Tania Yonow, an ecologist from ICIPE Kenya is arriving in August to work for one month with the Long Pocket Tick Ecology Group.

Last week a visitor from the University of Guam, Assistant Professor Don Nafus, held discussions on *Leucaena* psyllid.

Mic Julien is going to the Philippines on the 12 August to release *Cyrtobagous salviniae* to control the aquatic weed *Salvinia molesta*.

The biocontrol of *Salvinia* in Sri Lanka is revealing immense benefits. According to Peter Room a recent cost benefit study showed a $50 return for every $1 spent and for every one hour put into the project Sri Lankan farmers save 1700 hours of labour. Well done!

Shades of the Eltham Copper controversy in Victoria were felt in Queensland when Don Sands' evidence in a Brisbane court case caused prevention of a canal estate

How a major cover-up stopped a West Indian from eating the Queensland Museum.

Flick Pest Control wraps the Queensland Museum in PVC prior to fumigation.

When the Department of Forestry discovered that the historic Queensland Museum building was facing destruction from thousands of West Indian Dry Wood Termites (*Cryptotermes brevis*) there was only one company with the resources, expertise and manpower to solve the problem: Flick Pest Control.

Last July, Flick covered the entire structure with approximately 10,600 square metres of reinforced PVC (enough to cover 100 free-standing, three bedroom houses) in what was one of the largest fumigations ever undertaken in Australia.

West Indian Dry Wood Termites are considered the world's most destructive drywood termite and are an unusual occurence in Brisbane. As an introduced, exotic species they were first recorded in Queensland at Maryborough in 1964 and since then have only been found in Bundaberg, Childers and Brisbane.

Flick Pest Control are Australia's leading pest control company and the experts in fumigation, domestic and commercial pest control.

Consult your white pages for your local Flick Pest Control office.

Flick PEST CONTROL™

Don't chance it.
Remember: One Flick and they're gone!

development in a threatened mangrove area in Moreton Bay. A developer had challenged in the Local Government Court the rejection of their canal proposal by the Redlands Shire Council. Appearing for the Redlands Shire Council, Don's evidence regarding the tenuous population of the rare lycaenid, *Acrodipsas illidgei*, in the area swung the case against the developer. A small flutter for a butterfly but a mighty stride for conservation!

DES FOLEY
Regional Councillor

Queensland Agricultural College

Errol Hassan and Dr Galea conducted a very successful workshop on Plant Protection at Udayana University, Indonesia, sponsored by I.D.P. (International Development Program of Australian Universities). The workshop was attended by members of the Plant Protection Department of the University, and other interested staff members from various Indonesian Universities. A total of 18 delegates attended the intensive programme, which included morning lectures and afternoon practical sessions. The programme also included regular field visits. Dr Galea spent two weeks at the University before returning to Australia, Errol stayed on another week to round off the course. Most of the delegates expressed interest in post graduate Diploma courses in Plant Protection and MSc courses in Plant Protection, Horticulture and Agronomy. The 1990 Q.A.C. course handbook was distributed to the delegates and the teaching staff of the University.

On June 14, Dr Victor Eastop who is currently the President of the Royal Entomological Society of London and an aphid specialist at the British Museum, visited the department. After general discussions, Victor and Errol went on a tour of the Lockyer Valley to collect aphids. Victor was interested in a new aphid specimen which transmits watermelon mosaic virus, the aphid is found on cucurbits. Collecting was very successful.

Bureau of Sugar Experiment Stations, Bundaberg

The Bundaberg Cohort of Entomologists has increased by 50% with the arrival of Dr Ron Cherry from Florida. Ron is here for a 6 month sabbatical and will be working with Peter Allsopp on sugarcane whitegrubs. He will be based at Bundaberg but will be making at least one trip to Cairns, ostensibly to look at canegrubs but with ideas of spending free time diving on the reef.

Peter Sampson has been chasing soldier flies from Cairns to northern New South Wales. He managed to design an itinerary which gave him a free weekend in the north to fit in a spot of butterfly collecting.

Unattached

During late January and early February Ian Common spent some time collecting Micro-Lepidoptera in Tasmania. He had 3-4 days with Peter McQuillan in Hobart and spent time examining the Oecophoridae in the Tasmanian Department of Agriculture collection. Although the weather was dry, an interesting collection resulted. Ian also advises that he has corrected the page proofs to "Moths of Australia" and hopes it will be published shortly by Melbourne University Press.

DPI Entomology Branch

Staff in the QDPI complex at Indooroopilly have been packing their bags regularly. Merv Bengston (and the attached arm plaster) has just come back from a 2 week visit to Thailand, the Philippines and Asia to look at the co-operating laboratories in the ACIAR stored grain work. Merv. Pat Collins and Debbie Gillmartin attended the Australian Wheat Board meeting in Melbourne from 13-16 June. Dick Drew has just returned from a 5 weeks visit to laboratories in the USA and UK. Neil Gough attended the Perth Conference in Production and Marketing of Australian Flora where he gave a talk on gall wasps in Geraldton Wax. Neil Heather has just returned from a 2 week tour of Japan, the Philippines and Thailand, where he discussed their requirements on fruit fly treatments, particularly for mangoes. Victor Eastop visited the Indooroopilly complex for 2 weeks in late June. Staff from the country centres of the QDPI have stayed home and looked after the farm.

PETER TWINE
Regional Councillor

NORTH QUEENSLAND NEWS

Ross and Joyce Bell of University of Vermont, USA, spent 10 days or so on the Atherton Tableland in late May searching for very elusive rhysodid beetles. They had little luck at various sites because of the rain during their trip up the coast. Barry Moore (Canberra) organized a trip to his Julatten property at the same time but the third pair of hands did not make the rhysodids any easier to come by.

Greg and Alice Daniels spent 2 months in the lower section of the Peninsula in April/May collecting, concentrating on Asilidae and other Diptera. They had originally hoped to make it into the McIlwraith Range near Coen, but this year's good wet season rains made this impossible.

An ANIC expedition to McIlwraith a bit later (June/July) did manage to get in and obtain some reasonable material. Lepidoptera were taken in large numbers with over 15,000 specimens pinned. Those taking part were Ted Edwards, Marianne Horak, Ebbe Nielsen, Ian Naumann and Tom Weir, Ebbe was given the Megapode Award for the trip (taking over from a well known Canberra Dipterist) for crushing underfoot his enamel cup. Tom and Ian also spent a few days in Mareeba with Ross Storey discussing wasps and beetles.

Don Sands and Rose Broe spent a week or so around Iron Range in search of egg parasites for fruit piercing moths. They also discussed work on the pests with Harry Fay in Mareeba.

Kerri Huxham has started a project (with Ian Cunningham) at the DPI in Mareeba on coffee scales and their association with ants.

Adam Dunn is working with Keith Chandler at BSES Meringa for 2 years. Their main work at the moment is laboratory evaluation of controlled release insecticides against larvae of *Lepidiota* spp. (Scarabaeidae) . A recent visitor was John Fischer, a nematologist from South Australia at a interdisciplinary meeting investigating stool tipping in sugar cane.

Pat Collins (DPI, Indooroopilly) attended a Banana Industry meeting with Bruno Pinese (DPI, Mareeba) in Innisfail, where he talked on insecticide resistance in *Cosmopolites sordidus*. It was Pat's first visit to the north where he also visited DPI facilities in Mareeba.

Lands Department, Tropical Weeds Research Centre

Prior to taking up a post in East Africa to study biological control agents of prickly acacia, Jenny Marohasy undertook a familiarization trip to TWRC and further west to study prickly acacia (*Acacia nilotica*), closely related *Acacia* spp. and their associated native insects in early June.

Marie Ablin travelled to Brisbane in June to use the University of Queensland library facilities to research literature required for her part-time Master of Science (Tropical Ecology) studies. Whilst in Brisbane, Marie visited her old friends and colleagues at the Alan Fletcher Research Station. Marie and entomological assistants, Gayle West and Sarah Hilton, inspected giant sensitive plant (*Mimosa invisa*) for the impact of the biological control agent, *Heteropsylla* sp. (Psyllidae) in the Tully/Innisfail region. The GSP psyllid has dramatically effected seed production, plant size and density. Now it is back to the office to analyze all the data!

ROSS STOREY
Regional Councillor

NEW SOUTH WALES
METROPOLITAN SYDNEY

Forestry Commission of NSW

There are two Technical Officer positions waiting to be filled in Entomology at Pennant Hills! The results next time.

Australian Museum

Gerry Cassis is continuing his work on Tingidae and is now starting work on the Dermaptera as part of an ABRS grant. Geoff Holloway is preparing to give a day-long seminar on problems with Museum pests to the Powerhouse Museum, Sydney. He attended a Parasitic Hymenoptera workshop in Honolulu and returned with heaps of new information and ideas. David McAlpine is continuing his studies of Coelopidae. He and Gerry went on a collecting trip to the NSW South Coast in late May. The Tasmanian material Dan Bickel collected is now sorted. Gunther Theischinger has returned with volumes of drawings and notes based on his studies of the Alexander tipulid collection at the Smithsonian in Washington. And the specimens keep rolling in from the USNM and Bishop Museum to keep him busy for years to come. Unlike another famous Alexander,

Gunther will not have to weep that there are no more worlds to conquer!

The Entomology Department has received a large collection of Malaysian insects from George Hangay. Tony Bishop donated a collection of 2000 Australian butterflies. A couple of boxes of beetles and butterflies originally prepared by Roland Illidge, a turn-of-the-century collector from Brisbane, were donated by one of his descendents and will be incorporated into the Collection.

Don Colless presented a much appreciated seminar on numerical techniques in taxonomy to the entire Museum scientific staff; other visitors included Andy Austin, Waite Institute, Pete Cranston, ANIC; Vince Lorimer spent a day sorting the Museum's staphylinid collection.

Biological and Chemical Research Institute, Rydalmere

Many of the BCRI staff have now recovered from the recent AES conference and during the period of convalescence quite a few staff changes have taken place within the Entomology branch. Graham Gullick, who was working with Graham Baker, left in early May and Dr Victor Rajakulendran replaced Graham until the end of June. Meanwhile Danuta Knihinicki commenced working with Eberhard Schicha later in May. Farewell to Graham and welcome to Victor and Danuta.

While we have a few new faces in the Branch the old faces have been hard at work. Laurie Greenup was involved in the Tocal Small Farm Field Day (5-7 May); Andrew Beattie and Alan Clift displayed results from a large citrus spray trial at the Orange Field Day held 12-13th May at Orange. Later in May John Hamilton and Graham Goodyer visited south west NSW to collect mature *Heliothis* larvae. Graham Baker attended the Australian Wool Corporation Review Conference at Ballarat held 28th May - 1st June.

During June Roger Toffolon gave an address at the Pest Control Industry Expo held on the 15-16th June at the Airport Hilton, Sydney. Barry Wallbank visited Melbourne to participate in the meting of the working party at the Australian What Board to discuss grain protectants with State Bulk Handling Authorities. Murray Fletcher went to Canberra for discussions with Penny Gullan and Tingkui Quin at ANU and later Wendy Milne and Vic Eastop at CSIRO Entomology; Murray also found time to spend time working on cicadellid and fulgorid material at the ANIC.

Visitors: Dr Werner Bohin (Hoechst, Frankfurt), David Kingston (Hoechst, Melbourne), and Barry Brunsden (Philips-Duphar Aust.) on the 15th May to discuss chemical control of sheep blowfly and lice with Paul Hughes and Garry Levot; Peter Davis, Agriculture Protection Board of WA, visited Roger Toffolon and Murray Fletcher to discuss Argentine Ant research on the 25-26th May.

DAN BICKEL
Regional Councillor

Sydney University — Medical Entomology Unit

The major activity of the unit continues to be the Arbovirus Surveillance programme in NSW. Peter Wells has isolated arboviruses from both coastal and inland areas. The collections of mosquitoes have halted through winter to re-start in September, but we are still processing the many thousands of stored mosquitoes from previous months.

In May, all members of the Unit attended the 20th Annual Entomology conference, and presented a joint paper on the NSW Arbovirus programme.

Richard Russell and Danielle Heilpern addressed a meeting of North Coast Health Surveyors in Coffs Harbour and discussed aspects of the Arborivus programme. Danielle has resigned recently to go onto bigger and better things. Bozena Kozlowski is to commence in August as Danielle's replacement. Bozena is currently completing a Masters degree at Sydney University.

The Unit undertook an intensive survey of the Homebush Bay area in Sydney in May and is advising the Development Authority on a strategy for management of the mosquito habitats.

Richard visited Vanuatu in June as an AIDAB consultant to the local Health Department to advise and assist in the control of a major outbreak of Dengue Fever.

Richard also attended an interstate meeting of State Health Department representatives from NSW, VIC and SA to discuss common aspects of surveillance and control of arbovirus disease in South East Australia. He also participated in a workshop for national communicable disease surveillance in Canberra.

Sydney University - Macleay Museum

Woody Horning has been busy pinning and identifying a very large number of specimens for the Museum. Recently,

Woody received 5 large donations of insect collections from private individuals. There are significant collections from WA, Nth QLD and SE Asia. The SE Asian collections add to the Macleay Museum's sizeable foreign collections, which are the largest held in Australia. The donations of the collections has come about via the tax incentive scheme, whereby the value of the collections donated can be deducted from an individual's tax bill in a given year. Woody has organized to have collections donated via the scheme for several years to come.

Sydney University-Dept of Plant Path. and Agric.Ent.

Fred McDonald has just returned from a short overseas trip which was principally concerned with studying types of Pentatomoidea at the British Museum.

Jim Woodward, of the University of Melbourne, stopped by after his sojourn in the United Kingdom and Malaysia where he got a little collecting done.

Army Malaria Research Unit

In May the unit conducted a survey for the sibling species of the potential malaria vector *Anopheles farauti* s.l. in north-eastern Arnhemland. They were based in Jabiru, NT, and were able to survey a large area using an army helicopter. Due to favourable conditions, mosquito densities were very high, and a total of over 2000 *An. farauti* adults were collected from 70 sites scattered throughout north-east Arnhemland. The unit members were grateful to Peter Whelan, Paul Barker - Hudson, Wendy Kelton and Graham Dobson, Medical Entomology Branch, NT Department of Health, who provided laboratory facilities and gracious hospitality during several visits to Darwin. Richard Piper, who is based at Innisfail, QLD, where he is working with Tony Sweeney, accompanied them to Jabiru, to survey the collections for microsporidian parasites.

In early July, the unit hosted a meeting of the NSW Entomological Society. After some introductory remarks from Bob Cooper, and the screening of a video, the 16 visitors were taken on a brief tour of the laboratories.

Angelli Meza left the unit in May to work at the Australian Museum. After spending two weeks with the unit at Jabiru in May, Darren Waterson joined the unit in late June. Solomon Islands entomologist, Bernard Bakotee visited the unit in June to observe electrophoretic methods to distinguish the sibling species of *An. farauti*.

CERIT, University of NSW

Heloisa Mariath has left CERIT to take a position in the Department of Primary Industry in Canberra. Everyone wishes Heloisa and Peter good luck in their new jobs and housebuilding project. Heloisa's position as Project Scientist working on an Australian Wool Corporation funded project "Genetic basis for adaptation to oviposition suppressants of the sheep blowfly *Lucilia cuprina*" has been advertised. Further information is available from Chris Orton.

Lynette McLeod has resigned as Technical Officer on the Sheep Blowfly project at UNSW Fowlers Gap Arid Zone Research Station to take up an AWC Postgraduate Scholarship working on overwintering and dispersal of *L. cuprina* in the arid zone. Lynette will carry out the majority of her work at Fowlers Gap. A new 3 year arid zone blowfly project has just been awarded by AWC, so a Technical Officer is being sought to carry out the new project at Fowlers Gap. Further information from Jenny Anderson.

In July, CERIT was honoured by a visit from the Vice Chancellor, Professor Michael Burt. He spent considerable time with CERIT staff in discussions on CERIT'S future. As well he inspected all the testing and culturing facilities with interest (and maybe with a touch of nostalgia!?), as he was a blowfly biochemist before becoming an administrator. We also discussed with him the plight of entomological education in our institution and in Australia generally.

CERIT hosted the June meeting of the Entomological Society of NSW and Chris Orton spoke on the role of the centre and an inspection of facilities was made by some 30 visitors. At the end of the meeting discussions were held on how to approach the problems of entomology - education, professional status and job opportunities.

CERIT plans to hold another seminar series in the near future. Any ideas gratefully received.

The new aerosol testing chamber which is to be built beside the present chamber has been approved. On completion it will allow for an increased volume of testing and for further research on aerosol testing methodology.

Chris Orton and Jenny Anderson attended an AWC sponsored conference in Ballarat on pests and diseases of sheep pastures, which proved to be an exhausting but very fruitful three days. Jenny has been away on a number of occasions to speak at Department of Agriculture and Fisheries Field days on early spring treatment of sheep to

prevent blowfly strike. She has a few thousand more kilometres to travel before the expected large spring emergence of *Lucilia* occurs.

Chris Orton, Patrick O'Rourke, Chris Virgona and Belinda Wilson visited Evan Tovey at the University of Sydney to discuss culturing and control of house dust mite.

Recent visitors to CERIT have included: Cynthia Rowan, Wool Research Organization, New Zealand; Ross Runge, Cyanamid Australia; David Kingston, Michael O'Hara, Hoechst Australia and Werner Bonin, Hoechst West Germany; Ian Thompson and Helen Mann from Samuel Taylor and Ray Logan, CSIRO Division of Wool Technology.

University of NSW, School of Biological Science

Ross Crozier has received a grant of $8,000 to begin a study of the relationship between commercial and feral honeybees using molecular methods (mtDNA, nuclear RFLPs), and is being joined by hons. student Stella Koulianos who will be the chief worker on the project.

Scott Davis (Texas A&M) is also in the lab. for three months, and is participating in the honeybee work.

Penny Kukuk has received further NSF support to continue her work (with Mike Schwarz of LaTrobe and Ross) on Australian halictid bees.

Katherin Cohen continues her honours work on fig wasp sex allocation, impressed at the diversity of species within single figs.

Mark Elgar is away for several months visiting the Christiansen Institute in PNG. Mike Crosland is visiting Rob Page's group (UC Davis) to investigate the front line against an invading insect, the Africanized honeybee.

Risa Rosenberg, ex Cornell U., arrives in August, and will work primarily on butterfly ecological genetics.

Macquarie University - School of Biological Sciences

The Macquarie insect people have been hit by the travel bug, and are either just back, still away, or about to go.

Just back: Dinah Hales, from a month in Populationsgenetik, Universitat Tubingen, West Germany. A successful and enjoyable trip with two joint papers drafted and weekend sightseeing with sons Stephen and Peter. Desley Hughes, from a few weeks in Turkey, Greece and France *en route* to the Ant-Plant Interactions meeting in Oxford. Her poster at the meeting went well with the poster session continued in the pub. Mark Westoby and Barbara Rice, from study leave in the USA and from the ant meeting in Oxford.

Still away: Andy Beattie (see February issue). Andy returns soon to take over from biochemist Jan Gebicki as Head of School. Jan wants to get back to the bench before he retires in a few years' time.

About to go: Eren Turak, to the Third International Symposium on aphids in Hungary, where he will give a poster on his work on temperature tolerance in *Sitobion*. Eren's taking a couple of weeks holidays as well, and will be visiting family and friends scattered over the whole of Europe.

Gone: Steve Handel, via the Northern Territory and Asia on the return journey to New York.

PETER WELLS and MERILYN GEARY
on behalf of Danielle Heilpern
Regional Councillor

NSW COUNTRY NEWS

Yanco Agricultural Institute

John Hamilton and Graham Goodyer from BCRI, Rydalmere visited Yanco in May to set up an experiment aimed at determining the overwintering viability of *Helicoverpa armigera* in southern New South Wales. They were assisted by Mark Stevens and David James who showed how easy it was to bog Departmental vehicles in the Institute grounds!

David James has obtained industry funding for a new project on the biological control of vine mites using the phytoseiid *Amblyseius victoriensis*. The Wine and Grape and Dried Fruits research councils are providing funding for the next three years to enable employment of a Technical Officer to work on the project. Good news also on the aphid citrus bug front where funding has been obtained for two years from the Horticultural Research and Development Corporation to enable continuation of David's research on integrated control of this pest.

Tamworth, Agriculture and Fisheries

Margie Balfe reports Robyn Gunning has achieved a lot in her studies at Rothamsted in the UK working on techniques of biochemical toxicology in *Helicoverpa*. Robyn

is due to return to Tamworth in mid-August following a brief sojourn in Europe. In other Tamworth news, Boris has had his life enriched by the arrival of Edna. Both Giant Burrowing Cockroaches were courtesy of Harley Rose at the University of Sydney.

Agricultural Research and Veterinary Centre, Orange

Col Bower and Graham Thwaite participated in the Society conference in Sydney in May. At the conference they were pleased to be able to discuss deciduous fruit entomology matters with Nello Angerilli, formerly with Agriculture Canada at Summerland, B.C. and now with Simon Fraser University based in Indonesia.

Current and emerging problems with mite control in horticultural crops was the theme of a display mounted by the Orange duo at the Australian National Field Days Horticultural Exhibition in May.

Narrabri, Agriculture and Fisheries

Matt Cahill has just left for the UK where he will be married in August. Matt and Sally return to Narrabri in September via the States.

Entomological Baby boom at Narrabri Research Station. Ken and Carol Brook have just had a baby boy, while Gary Fitt and Lewis Wilson are imminent fathers (Gary the second time around, Lewis the first).

Neil Forrester addressed the Annual Convention of the Aerial Agriculture Association of Australia on Predicting the Occurrence of Insect Pests on Cotton and other Field Crops. This was held at the Gold Coast in July.

Narrabri, CSIRO Cotton Research Unit

Les Bauer visited the BCRI at Rydalmere recently to discuss identification of thrips from cotton with Graham Brown.

Lewis Wilson had Dr Tom Leigh (University of California) visit for five months over summer on sabbatical. They undertook collaborative work to see if use of broad spectrum chemicals on cotton early in the season leads to subsequent two spotted mite outbreaks. They also investigated the use of selective miticides on cotton. Tom will return for a few weeks in August to participate in a Cotton Research Council review of entomological projects. Other reviewers will be John Brettel (Zimbabwe), Vic Edge and Ralph Schulze. They will review CRC funded projects in Canberra, Narrabri, Armidale, Toowoomba, Gatton and Brisbane.

Gary Fitt has just returned from another inland trip to investigate sources of *Heliothis*. He travelled through western NSW, northern SA and on the Birdsville track returning via the channel country of western Queensland. Gary reported significant vegetative growth after the recent rains with moderate *Heliothis* populations.

DAVID JAMES
Regional Councillor

SOUTH AUSTRALIA

South Australian Museum

Around the time of the Mallee Conference in Adelaide, John Greenslade (CSIRO Soils, Canberra) and Alan Yen plus Peter Lillywhite (Museum of Victoria) visited us, Peter spending some time with Eric Matthews on identifying beetles from pitfall traps in the Mallee Survey of the Sunset Country of northwestern Victoria. Chris Reid (ANU) spent a couple of weeks in May working on our chrysomelid beetles. Fred Macondald (University of Sydney) called in to work with Grodon Cross on a paper they are doing on pentatomid bugs. At the beginning of May members of the Entomology and Arachnid Sections (Gordon Gross, Jan Forrest, David Hirst and David Lee) went up to the Gammon Ranges to do some collecting. The moisture from the previous heavy rains made for some interesting finds, but it had disadvantages and its continuation resulted in the party drinking more tea than beer.

CSIRO Entomology and Soils

Early in the year, the zoologists gladly vacated their dingy old premises for a newly appointed laboratory in the main building of the Division of Soils. The disruption of the move seemed well worth suffering and many a relic was found behind old benches as they were moved for the first time in years (including a termite colony that was eating out Ken Lee's desk from behind). A few weeks after the move, a pipe burst two floors above the new laboratory causing major flood damage throughout the building. So now the "new" laboratory is being redone and work continues amidst painters, electricians, carpenters and jack-hammers yet again.

Geoff Baker avoided some of the chaos by travelling to the UK, France, Switzerland and The Netherlands. Geoff gave an invited paper at a British Crop Protection Council symposium on the ecology and control of snails and visited Montpellier and Avignon in France for discussions on the collection there of sciomyzid flies for the forthcoming joint project with Dennis Hopkins (SA Department of Agriculture) on the biological control of Mediterranean white snails. He also visited several laboratories in Europe to learn of current research on the ecology of bruchid pests of legumes, particularly that relevant to the biological control of pea weevil. Geoff Baker and Ken Lee attended an Australian Wool Corporation workshop in Armidale, NSW on Biological Processes and the Fertility of Temperate and Mediterranean Pastures. Geoff Baker also gave a paper at the AWC Research Review Conference on Weed, Invertebrate and Disease Pests of Australian Sheep Pastures in Ballarat, Victoria.

Earthworm research is on the ascendancy in Adelaide, with a new initiative aimed at increasing earthworm numbers and improving structure and fertility in pasture soils. This adds to John Buckerfield's current program on earthworms in croplands, in particular those where reduced-tillage is practised.

Visitors have included two French workers, Patrick Labelle (Ecole Normale Superieure, Paris) and Andre Kretzschmar (INRA, Avignon - here for 12 months).

University of Adelaide

While our termites are probably active too (CSIRO Soils is not alone in being infested), all else is quiet here. Dr S.S. Lee, from the University of Malaysia, Kuala Lumpur, spent a month of sabbatical in the Zoology Department, working on his own collections of Malaysian psocids. Alice Wells took time off from sorting through vast collections of Alligator Rivers Region (NT) caddis flies to go to the Australian Society for Limnology meeting in Canberra in July. The Alligator Rivers caddis fauna still keeps expanding - from 30 or so species known in early 1988 it has grown to over 90.

Agriculture Department

Peter Allen attended the meeting of the Australian Wheat Board's Grain Protectant Working Party held in Melbourne in June; he also presented a Review Paper at the Australian Wool Corporation Conference on pests of Australian sheep pastures held in Ballarat in May.

ALICE WELLS
Regional Councillor

VICTORIA

Plant Research Institute, Burnley

Garry McDonald, along with colleagues Alistair Drake and Roger Farrow (CSIRO Entomology) recently returned (hurriedly) from a research mission into NE China, where a most impressive migration of armyworm moths (*Mythimna separata*) was studied. The migration was monitored with radar, moth traps and an aerial net from its inception, although the study was cut short when the team made a hasty retreat after the Tian'anmen Square massacre.

Peter Williams was recently appointed to a National Association of Testing Authorities Australia (NATA) panel to assess the suitability of the Australian Wheat Board (AWB) laboratories to conduct a range of biological tests on insect pests of stored grain to NATA standards. Peter attended the AWB Working Party on Grain Protectants meeting in June. After the meeting Merv Bengston and Debbie Gillmartin from DPI, Queensland and Barry Wallmark from BCRI, Rydalmere NSW invited Peter to discuss the latest developments in research on control of insects pests of stored grain.

The Daratech-owned pest monitoring company, Cropwatch, has established an office in the Horticultural Entomology building at PRI. The office will be used as a base for providing a pest monitoring service to fruit growers in the Bacchus Marsh, Harcourt, Eastern Metropolitan, Peninsula and Gippsland areas. Kaye Hergstrom has been appointed as the area manager. Cropwatch already use some of the technology developed by the Horticultural Entomology section at PRI. Establishment of this office will allow a more rapid transfer of pest management technology to the fruit growing industry.

Keith Turnbull Research Institute

Ross Field has been promoted to Leader of the Biological Sciences group of the Land Protection Division of CFL. Ross's host specificity testing of the European wasp parasite *Sphecophaga vesparum* (Hymenoptera : Ichneumonidae) has been completed and if permission is granted, releases will begin in spring, Phil Spradbery from CSIRO, Canberra, visited KTRI to investigate pheromone secretion by queen European wasps.

Ross Field, Ros Shepherd and Elegio Bruzzese attended the presented papers at the Australian Wool Corporation Review Conference on "Weed, Invertebrate and Disease Pests of Australian Sheep Pastures" held in Ballarat during May.

LaTrobe University

Tim New leaves for Europe in mid-August, where he will participate in the IUCN/SSC meetings in Rome and various workshops and meetings on invertebrate conservation in the UK. He will also be looking at lacewings in the British Museum. Ian Thornton will also attend the Royal Entomological Society's Symposium on Insect Conservation and will present some entomological findings of the Krakatau research project. He is also to visit the Charles University, Prague and the Czechoslovak Academy of Sciences in Leske Budejovice, Bohemia. Our third wanderer, Seamus Ward, leaves soon to represent entomological findings at the International Conference on Invertebrate Reproduction in Nagoya and the Aphid Symposium in Kecskemet, Hungary. He also expects to visit Kobe University, The Agricultural University in Wageningen and the University of East Anglia.

Dr S.S. Lee (University of Malaya, Kuala Lumpur) recently visited to discuss a joint project on Malaysian psocids with Tim New. Dr Penny Kukuk is collaborating with Michael Schwartz on projects on sociality in native bees and has a pied-a-terre in the Department. Amanda Kobelt (Hons 1988) has commenced her PhD project on *Heliothis punctigera* on field peas.

JANET HORNE and PATRICK VAUGHAN
Regional Councillors

TASMANIA

Agriculture Department

John Ireson reports that the ragwort beetle *Longitarsus flavicornis* (Stephens) has established permanently at 20 sites and has more tenuous populations at another 15 sites. At the 20 permanent sites the beetle occupies 300 ha and has controlled ragwort in 150 ha of this area. Following an intensive rearing program, John released 17,500 L. jacobaeae (Waterhouse) adults mostly in northern Tasmania to attempt control under drier conditions than at the L. flavicornis sites. Susie Pearn, a relatively new member is working on techniques for on-farm mass production of Metarhizium fungus for control of the subterranean feeder redheaded pasture cockchafer. Andrew Rath is expanding the fungal biocontrol effort against pasture corbie with establishment of a new lab for research into a new Microhilum fungus. This is funded by the Australian Meat and Livestock Research and Development Corporation and brings with it 2 new faces - Dr Paul Wright from New Zealand and Vin Patell from the relocated CSIRO nematode unit. Margaret Williams was the only Tasmanian to attend the A.G.M. in Sydney. Margaret has been looking at alternatives to Kilval for woolly aphid control on apples because of resistance problems.

Museums

Bob Green at Queen Victoria Museum published a study of the 'Food of the grey-breasted silvereye' (Tasmanian Naturalist 96: 8-10) showing how the forest birds fed mostly on larvae of chrysomelid beetles and lepidoptera in spring to early summer but then turned to fruits in summer and autumn. Alison Green of Tasmanian Museum had a lousy anecdote to tell. A request from Ricardo Palmer of National Museum of N.Z. for lice records produced a taxonomically suspicious combination of louse and fjordland created penguin host. Checking revealed both the original louse and penguin host identifications to be wrong. The true host was in fact a rare (Tasmanian second) specimen of Royal Penguin from Bicheno far from its normal Macquarie Island habitat. Another victory for taxonomy. Tasmania is a small state with diverse habitats so collectors don't have to travel hundreds of kilometres. Alison reports that the first ever specimen of the exotic ladybird *Coccinella undecimpunctata* L. found in Tasmania was actually collected inside the Museum in 1970.

Forestry Commission

Humphrey Elliott has initiated a federally funded survey of invertebrates in wildlife corridors to obtain baseline data. Initially 360 pitfall traps are being operated monthly for one year.

University of Tasmania

John Madden has 3 students currently writing up studies. Sutohn Suwanbutr is writing up her thesis on biology, ecology and control of lucerne aphid. Robert Mensah has begun to write up his study of integrated control of boronia psyllid. Robert screened 8 systematic chemicals and developed a stem spray system that minimises disruption to predators. Robert also discovered an interaction between the psyllids and alarm pheromones of the cowpea aphid Aphis gossypii Koch. Psyllids rarely occur where cowpea aphid is present. Cao Yong is writing up a masters thesis on integrated control of two spotted mite in hops. This work included evaluations of some old insecticides.

Hobart Technical College

Laurie Miller has been giving courses on pesticide handling to provide formal training for pest control operators in conjunction with the Agricultural and Veterinary Chemicals Association.

Unattached

Ted Martin continues his revision of *Chlenias* moths and production of a provisional checklist of Tasmanian Lepidoptera.

LIONEL HILL
Regional Councillor

NORTHERN TERRITORY

Office of the Supervising Scientist, Alligator River Region

Peter Dostine will be attending the Australian Society for Limnology congress in Canberra during July. Recent visitors to Jabiru include stream ecologist Dr John Brittain from the Zoological Museum, University of Oslo and theoretical ecologist Dr Dan Faith from CSIRO Wildlife and Ecology. Both offered valuable advice on monitoring strategies for ARR stream systems.

CSIRO, Tropical Ecosystems Research Centre

Alan Andersen attended the 11th Northern Australian Mini Site Rehabilitation Workshop held in Jabiru in June and presented a paper on the use of ants as indicator species. In July Alan attended the Ant/Plant Interaction Symposium in Oxford to report on parallels between ant and plant communities.

DPIF Entomology Section

Stuart Smith is currently holidaying in the Middle East and Geoff Strickland has embarked on a round Australia tour on six months long service leave.

Dr Li will be submitting a paper "Status and Control of *Chilo* spp. in Oceania" for the First International Symposium on the Cereal Stemborer *Chilo*: Nairobi, Kenya, 26-29 July 1989.

The screw worm fly detection program was wound down in June with nearly 180,000 flies being trapped and identified during the last twelve months. Technical Officer Haidee Brown is still under sedation.

DPIF Weeds Section

Releases of the Mimosa moth *Neurostrata gunniella* suffered a setback when the annual burn-off melted the walk-in field cage. All was not lost, however, and the moth is thriving in the field. *Neurostrata* became a national celebrity when it appeared naked in "The Picture" magazine in an article entitled `Is this little bugger more dangerous than napalm?' A semi-naked young lady named Melinda looked on from an adjacent page. She is now being questioned for suspected arson.

Dr Sawai Buranapanichpan (National Biological Control Research Centre, Thailand) and Wendy Forno (CSIRO, Indooroopilly) visited during June to study the progress of Mimosa control. They were not alone in their interest. The ABC 'Countrywide' team and a film crew from the Department of Foreign Affairs both featured Mimosa recently. Colin Wilson and Sawai are now sitting by their phones awaiting calls from Steven Spielberg. Colin fancies himself as the new Mel Gibson and Sawai would like to follow in Bruce Lee's footsteps.

DPIF Agricultural Quarantine Service

NAQS surveys have taken Ted Fenner to some remote corners of the Territory in recent months. In May, he participated in a four day helicopter and ground survey of the largely uninhabited north coasts of Bathurst and Melville Islands. In June, the survey of eleven days was vessel-based and covered the northern part of Croker Island as well as Oxley, McCluen and North Goulburn Islands (the last three uninhabited). Although no plant pests and diseases of quarantine significance were found, there were some interesting occurrences of insects on native plants, not to mention frequent sightings of crocodiles, turtles, dugongs, and a tern rookery. Veterinary personnel had a lively time of it, with feral buffalo, horses, cattle, pigs and goats at one place or another in the surveyed areas.

NT Health, Medical Entomology Branch

Georgina McLean joined the staff in mid June to provide much needed Admin. backup.

Paul Barker-Hudson and Graeme Dobson have been carrying out (further) trials on Abate application by helicopter. Efforts to accurately determine swathe widths and granule distribution have so far been dogged by equipment malfunctions. However, they are persisting and should have the system tuned ready for the onset of the *Aedes vigilax* season in September.

Plans are once again underway for a new Entomology laboratory to be incorporated into new buildings for the Menzies School of Health Research. Peter Whelan has been sitting on the Planning Committee and hopefully predicts a new lab by 1991.

The recent discovery of *Aedes albopictus* larvae in a monitoring egg trap in the wharf area at Darwin has caused a flurry of activity in determining the extent of importation. Thankfully all investigations indicate that it was a recent and limited importation with no further larvae located.

STEPHEN COLLINS
on behalf of Stuart Smith
Regional Councillor

AUSTRALIAN CAPITAL TERRITORY

CSIRO Division of Entomology

The really big and very welcome news is that Max Whitten has been re-appointed as Chief of the Division for a further five year term. Congratulations Max.

News from the biological control of weeds group is encouraging with Jim Cullen reporting that our introduced agents are thriving. The insect recently released on Patterson's curse, *Dialectica scalariella*, has now established and is spreading, as is the moth *Neurostrata gunniella*, on *Mimosa pigra*.

The nematode group, recently transferred from Hobart, is now up and running in the new facilities in Canberra. Robin Bedding has recently returned from a month's consulting trip to Brazil, where *Sirex* wood wasps are a very big problem in pine plantations. They are now going to use the pathogenic nematodes that have been so successful here. Robin, Ray Akhurst and Jonathon Curran are off in August to California as invited speakers at the first major conference devoted exclusively to entomopathogenic nematodes. Each will contribute a chapter to a CRC Publication on the topic. Ray Akhurst is currently in France, working with Dr Boemare in Montpellier on a CSIRO/IRNA co-operative project on entomopathogenic nematodes and their associated bacteria. Recent promotions in the group are Robin Bedding to Chief Research Scientist and Graham Crompton to Senior Technical Officer Grade 1.

Research on insects can lead to interesting sidelines. Mike Lacey was involved in development of a technique to measure the minute quantities of pyrazines used as warning odours by many species of brightly-coloured insects. It appears that related compounds are present in minute quantities in certain grapes and are responsible for the distinctive varietal odours of Cabernet Sauvignon and Sauvignon Blanc wines. Make has just received a grant from the Grape and Wine Research Council to determine the types and concentrations of methoxypyrazines in grapes and wine, establish the sensory role of the methoxypyrazines and assess the extent to which fruit origin and maturity influence the role. One glass for the analysis, one glass for me, one for the analysis.

The molecular biology section has brought in 2 big grants recently. The first is from ICI to produce a genetically-engineered viral insecticide for *Heliothis*. The

project will keep Peter Christian, Val Baule, Paul Simpson and Alagacone Sriskantha very busy for the next 3 years. The other grant is from the Cotton Research Council to develop an ID kit to distinguish eggs and small larvae of *Heliothis armigera* and *punctigera*. The kit will use monoclonal antibodies and is designed for use by growers and crop consultants. Stephen Trowell will be doing the work.

In June, Roger Farrow and Alistair Drake visited China in company with Garry MacDonald of the Victoria Department of Agriculture and Rural Affairs to carry out a collaborative study with Chinese entomologists from the Jilin Academy of Sciences on armyworm migration into northeastern China. Although successful, the trip had to be cut short because of the troubles in Beijing and other parts of China. Roger has just been promoted to Senior Principal Research Scientist.

Penny Edwards departed in June for an overseas trip that will take her to the International Symposium on Insect-Plant Relationships in Hungary, where she will present a paper on the role of leaf waxes in structuring herbivore communities in eucalypts. She will also be visiting various research institutes in the UK and Finland.

Eric Hines, of the electron microscopy unit, has received his well-earned promotion to Senior Technical Officer Grade 3, Colin Beaton will be presenting a lecture at the National Science and Technology Centre on Microscopic Views of Insects.

Michael Lenz, Sil Runko, Lee Miller and George Lutton have just returned from 4 weeks in Darwin. They were collecting bulk supplies of termites for experimental work and also tending ongoing trials of new soil treatments for building protection and resistance of certain plastics to termite attack. Seems like an excellent way to spend apart of the Canberra winter. Michael has a terrific tan.

Now that the official launch of Siroflo is out of the way, Bob Winks is becoming more and more interested in tropical entomology, especially those insects on the fruit and nut trees on his new farm in Queensland. Peter Annis and Jan van Graver recently travelled to the Philippines to teach a 5 day course on controlled atmosphere and fumigation of grain, funded through ACIAR.

Wendy Milne has been spending a lot of time in quarantine recently, tending our newly arrived parasites for Russian wheat aphid. The idea is to establish them on alternate hosts in advance of the potential (unwanted) arrival of the pest.

Both Eric Rumbo and Alistair Drake have been promoted to Principal Research Scientist. Bob Sutherst (Indooroopilly) has been promoted to Chief Research Scientist.

JANE WRIGHT
Regional Councillor

CSIRO, Australian National Insect Collection

News from the Taxonomy and General Biology Section of CSIRO Division of Entomology (a.k.a.ANIC) is dominated by the threatened retrenchments of three of the staff. The funding cuts forced on CSIRO have resulted in quite disproportionate reductions in taxonomy and the future looks even bleaker if our Institute Director's plans are implemented.

John Balderson has been in the Division for twenty years providing technical support to Ken Key and subsequently Dave Rentz in their researches on orthopteroids. John specialises in the Mantodea and, as with the other targeted scientists, covered his specialist group for the imminent "Insects of Australia".

Bob Taylor's plight made the front page of the Sydney Morning Herald in mid-July, in ironic contrast with an inner page feature that stressed Australia's need for inventory studies in relation to current environmental issues. Bob has worked here for over 20 years since leaving E.O. Wilson's group at the Museum of Comparative Zoology at Harvard and is a past section leader. Ecologists using ants in their studies need a taxonomic foundation; assignment to "functional groups" should be no more than a temporary expedient.

Mary Carver came to ANIC in 1983 from biocontrol of aphids to look after the Hemiptera/Homoptera, one of the major but neglected economic groups. Mary's expertise lies in all aspects of aphidology, including taxonomy, virus transmission, host plant and parasitoid relationships. The curatorial and identification load has been great and many Myrmecia readers will have sought Mary, Bob and John's assistance.

The loss of these scientists and their posts would be a retrograde step for Australian entomology. As was reported in the Sydney Morning Herald, the expertise of our

colleagues may not be lost entirely since taxonomists rarely retire. However, ANIC already depends heavily on the goodwill of retired fellows, whose numbers are comparable now with those of salaried staff, and it is hardly a good sign that the average age of entomological taxonomists is so high. Letters protesting the loss of individuals, their posts and/or the general reduction in taxonomic support will be welcomed. These should be addressed to: **Dr E.S.Henzell, Institute of Plant Production and Processing, CSIRO Headquarters, Limestone Avenue, P.O.Box 225, DIXON.ACT.2602.**

Meanwhile an impressive collection was made under arduous conditions in the McIlwraith Range by Ebbe Nielsen, Marianne Horak, Ted Edwards, Tom Weir and Ian Naumann. Back home in the Tineid Research Centre, Marianne has replaced Juleen Cavanagh, who is pursuing a PhD at ANU on a part-time basis, and Brendan Smith is also helping out.

Dave Rentz is travelling overseas, and Ebbe's turn around time before overseas departure (Japan, Europe) was minimal. Penny Greenslade has returned revitalised from Tasmania and Gerry Cassis has extended his stay at the Australian Museum.

Visitors to ANIC included another ex-British Museum Dipterist, Tony Hutson, now conserving bats and fuming at the Mount Etna massacre, Roger Kitching emerging from tropical phytotelmata (use your dictionary), Graham Gilchrist, Cynthia Rowan, and David Crosby looking at Lepidoptera. Ross and Joyce Bell are still quietly beavering away but I'm not sure if they are still hunting elusive rhysodid beetles.

Australian National University

Shelley Rozario has completed successfully her Master's thesis on eurymelids on *Eucalyptus* and Sunita Bhatti nears completion of her taxonomic thesis on Australian Monophlebuline Margarodids, having given her final PhD seminar in Mid-July. John Trueman tells me he has three papers from his successful Diploma nearing completion before he gets down to using molecular taxonomic techniques on his odonates as part of his PhD study.

Penny Gullan has taken to eluding the mountains of text and cladograms generated by her students by disappearing to write in ANIC, before heading for an over-wintering sabbatical at the Indooroopilly DPI labs in Brisbane.

Several of the Coopers and Cladists discussion group took an away trip to a most interesting Australian Systematic Botany Society meeting to learn more about molecular techniques and Gondwanan biogeography. An argumentative bunch joined Gerry Cassis' discussion group in a Cooper's pub close to the Australian Museum - sorry about the lack of decorum, Gerry.

PETE CRANSTON
Regional Councillor

WESTERN AUSTRALIA

Agriculture Protection Board

Peter Davis returned from his trip to the USA where he was investigating options available for the control and management of Argentine ants. He spent most of his time at the University of California, Riverside and Davis Campuses. No immediate panacea for the Argentine ant problem resulted, but the direction of the proposed research (concentrating on baiting techniques) was confirmed. American experience and the development of baits and baiting practices for ants is extensive and information gained in America will allow for an accelerated research programme in Western Australia.

Peter was also able to visit the USDA facilities at Gainesville, Florida and Gulport, Mississippi which research Imported Fire Ants (IFA's) and he attended the annual Imported Fire Ant Conference. Most of the research on ants in the USA is concentrated on IFA's and discussion with the IFA researchers proved very rewarding.

On the return journey Peter stopped off in NSW to discuss with Vic Edge, Roger Toffolon and Murray Fletcher, the common Argentine ant problem faced by NSW and WA. General agreement was reached that research on Argentine ants between the two states should be shared to avoid unnecessary duplication.

Department of Agriculture

Chief Entomologist, Nic Monzu travelled to Kununurra to discuss the northern Entomology Research Programme with Peter McFadden. Funding for a programme to investigate the parameters on which a practical crop scouting system

for oilseed crops could be based was recently received from the Oilseeds Research Council. Also discussed was the proposed introduction of a Mirid bug (via Queensland) for the biological control of the prickly pest shrub, *Parkinsonia*.

Peter also reports the first commercial damage to rock melons by fruit piercing moths, *Othreis materna* in Kununurra. This apparently was the result of late summer rains allowing the moths to survive longer and overlap with the maturing rock melons which were planted earlier than in previous years.

Funding for a Dung Beetle Programme has recently been confirmed from the State Government. The programme will involve the quarantining and breeding of dung beetles by CSIRO in Victoria and their release and monitoring by staff of the Department of Agriculture.

The occurrence of Queensland Fruit Fly, *Dacus tryoni*, in the Perth metropolitan area is high on the priority list at present. Further extensive surveying has expanded the known infestation to 100 km2. Currently, the infestation does not include any commercial orchards. Private consultant Alan Bateman (ex CSIRO) was brought over to advise Entomologists from the Department of Agriculture. The consensus was that eradication is possible using a combination of baiting, lure traps and sterile male release but at an estimated cost of $6 million. If the programme is to be successful it needs to be implemented this spring. A decision by the State Government on whether to proceed or not is expected soon.

Bill Woods reports that 100,000 of *Dialectica scalariella*, the biological control agent of the weed Patersons curse, have been released. Releases have been made at 140 sites throughout the south-west of the state. Successful establishment and spread has occurred at many sites, especially in the Swan Valley.

Neil Gough from Queensland came over to look at the gall wasps of geraldton wax in Western Australia, where it is native. Plantings in Queensland suffer considerably from gall wasps of which there are 3-4 species. The situation is complex as some are primary parasites and some may be inquilines. Gall insects of Geraldton Wax in WA are not as damaging as they apparently are in Queensland.

David Yeates returned from his Northern Australian Quarantine Strategy survey in May. He reports the highlight of his trip was a flight in a stock mustering helicopter to Sunday Island, in King Sound near Derby, to sample insects on plants around an abandoned mission. On landing the helicopter's exhaust ignited the Kimberley cane grass with disastrous results. Suffice to say that all insects on the island were eradicated by the fire and our fearless biologists were left marooned in the centre of the blackened landscape until return of the helicopter later in the day. It now appears that Peter Davis will have to revisit the island to survey for fire ants! David also visited Brisbane in late June and spent time at QDPI, the University and the Queensland Museum catching up.

Rob Emery went to Melbourne in June to attend the annual meeting of the Australian Wheat Board's Working Party in Grain Protectants. He also went to Merredin where he met members of the Senate Select Committee which is looking at chemical useage on farms.

In Albany Mike Grimm reported the unusual case of spotted alfalfa aphids, *Therioaphis trifolii*, doing considerable damage to sub-clovers. The damage had been patchy but in some places where it has occurred sub-clover has been killed outright in areas of up to several hectares. The cause of the switch to sub-clovers needs to be investigated further.

John Sandow, Anne Hill and Francoise Berlandier made it to the AES AGM in Sydney. Afterwards, John and Francoise spent a few days in Canberra with Mary Carver at ANIC where they talked aphids and provided samples of native aphids trapped in the south-west of Western Australia as part of an export seed potato industry programme. One of the species trapped is possibly a new species.

John Sandow surprised everyone with his unexpected announcement that he is resigning from the Department of Agriculture to take up a position with ICI as Senior Research Officer. He will join ICI at the end of August. John has been a productive and enlightened member of the Entomology section at South Perth since 1978 and he will be missed. We wish him well in his future endeavours and hope his career opportunities expand with the new direction he has taken.

Department of Conservation and Land Management

Ian Abbott has recently finished a manuscript on bullseye borers, *Tryphocaria* sp. of Eucalypts of the south-west of Western Australia. His section has also completed a survey of the termites of the Perth metropolitan area responsible for economic damage to timber. Tony Postle has been contracted for a short time to identify the species

collected and is currently immersed in this activity.

Janet Farr is expecting the arrival of her first insectary at Manjimup. This was one of her primary tasks when she took up the position there. The big event is expected to be completed by mid-August. She recently went on a trip to Jerramungup to inspect lerp damage to farm trees. This appears to be an emerging problem of sizeable proportion and deserving of in-depth research.

Curtin University

Jon Majer is currently in England attending a conference on Insect-Plant Interactions at Oxford University. He will return briefly to Australia before travelling to Brazil for six months sabbatical study.

CSIRO

James Ridsdill-Smith and his wife are re-charging the batteries, reportedly by back-packing through Thailand. It is hoped they successfully skirt around malarial mosquitoes, drug runners and 10 metre boa constrictors.

Health Department

Following 175 mm of rainfall at Karratha over two days Tony Wright inspected the area to help clarify the relationship between rainfall and Ross River virus (RRV). Last time (1984) such rainfall occurred in the area, 40-50 cases of RRV were reported. The most prevalent flood water mosquito was *Aedes pseudonormanensis*. Whilst RRV has not been isolated from this species, Murray Valley encephalitis has on one occasion. Tony collected some 30,000 pupae and the identification process is still in progress.

Despite the rainfall, only moderate numbers of adult vectors occurred. Possibly associated with this was the unusually high occurrence of the mosquito predator *Ae. alternans*.

Murdoch University

Jenny Davis and her team have completed the second year report on their project - 'Midge Control in Urban Wetlands'. In the second year they used open and closed enclosures to measure the distribution and efficacy of aerially applied granular larvicides. Results of this work have enabled them to advise Councils on improved methods of aerial application. In the third and final year of the study they will be looking at laboratory and field performance of existing and candidate larvicides.

Jenny is off to Munich in August to attend a Limnology Conference where she will be presenting a paper titled - "The influence of Stream Flow on Invertebrate Fauna of Streams in Karri Forests".

Post graduate student, Belinda Robson will commence an Honors project which will be investigating the effects of salinitiy on stream invertebrates in Wandoo forests south of Perth.

West Australian Museum

Terry Houston and crew have been busy organising an exhibition of butterflies. The main theme of the exhibition will be tropical species of rainforests of the world. The specimens, numbering in excess of 3,000, have been drawn from two private collections belonging to Bob Hay and Hugh Bollam.

University of Western Australia

Research into insect mating systems, particularly the corixids, bittacid hangflies and tettigoniids is receiving a boost through the visits of Ron Aitken (Mt Allison University, New Brunswick Canada) a second trip, sponsored by the Royal Society of London, for Leigh Simmons (University of Liverpool) and another return to his old mating grounds for Darryl Gwynne (University of Toronto). They will be assisted later in the spring by Heiner Romer of Ruhr University, Bochum. Ron hopes to make some underwater recordings of various corixids in WA, Leigh and Darryl will concentrate on the mating system of bittacids and the peculiar and as yet unnamed zaprochiline tettigoniid, and Heiner will be in Perth as part of his Heisenberg fellowship for 6 months carrying out field neurophysiology with Win Bailey. At the time of writing Andrea Schatral is close to producing her first progeny and we wish her and Paul Yeoh well.

The definitive volume on the Tettigoniidae - Biology, Systematics and Evolution (edited by W.J. Bailey & D.C.F. Rentz) is with the publishers and is hoped to be on the shelf for Christmas.

PETER DAVIS
Regional Councillor

News from Affiliated Societies

ENTOMOLOGICAL SOCIETY OF NSW INC.

The recent meetings of the Ent. Soc. NSW Inc. at CERIT and the Army Malaria Research Unit have proven to be very educational excursions. In both cases the staff (Chris Orton and Jenny Anderson at CERIT, and Steve Frances and Bob Cooper at the Army Malaria Research Unit) gave informative introductions to the history of the establishments which were followed by guided tours of their facilities. They were great nights and thanks on behalf of the Society to all involved!

Future meetings are sure to be of a similar standard. In August Mary Lyn Taylor (spouse of Ted Taylor) will address the Society on Environmental Law while Bob Taylor from the ANIC will give a presentation in September.

JOHN MACDONALD Representative Councillor

ENTOMOLOGICAL SOCIETY OF QUEENSLAND

At the June 13th meeting, Dr Victor Eastop from the British Museum gave an interesting talk entitled "Doubts about aphids in Australia". Vic, as President of the Royal Entomological Society of London, was presented with an inscribed red cedar case containing a large male of the spectacular stag beetle, *Phalacrognathus muelleri* (Macleay), the emblem of the Queensland Society. The beetle is to be permanently displayed in the Royal Entomological Society's rooms at Queens Gate, London. Fittingly, the presentation case was personally constructed by our current President, Neil Gough.

Forthcoming meetings include talks on Eriococcidae (Hemiptera) in August (Penny Gullan), biting midges in September (Eric Reye) and cicadas in October (Tony Ewart). The November meeting will be the Annual F.A.Perkins Memorial Lecture and Dick Drew will trace the history of fruit fly research in Australia from its beginnings, in which F.A.Perkins played a leading part, to the modern era.

GREG DANIELS Representative Councillor

Neil Gough (right), President of the Entomological Society of Queensland, presents a specially mounted specimen of the ESQ emblem, *Phalacrognathus muelleri*, to Victor Eastop, the President of the Royal Entomological Society of London.

ENTOMOLOGICAL SOCIETY OF VICTORIA

The first half of 1989 has brought about several changes for the Society.

Our editor of the Victorian Entomologist news bulletin, stepped aside in February. We extend to Ian Faithfull our best wishes for his future. The new editor is John Burns, and we wish him well.

Michael Braby has moved to Townsville, and the position left vacant on council has now been filled by Beresford Vardy.

Perhaps the highlight of our meetings this year has been an address and slide presentation by Bob Fisher, who spoke on "Butterfly Photography".

The address was in response to his receipt of the "Zoo" Le Souef Memorial Award.

Nominations are now sought for this annual award, and these should be addressed to the Secretary of the Society by the end of October 1989.

MARK M. HUNTING

Representative Councillor

Overseas News

NEW ZEALAND

The Golden Orbweaver, a spider creating interest in New Zealand

In the past, a species of golden orbweaving spider (*Nephila* sp.) has appeared in various places in New Zealand. In 1975 one was collected in Dargaville, then another in 1976 in Tauranga. Then in the autumn of 1982 one turned up in Cambridge, near Hamilton.

More recently in April 1988, a single specimen was found in a suburb of Hamilton, and in the same month one spider in a suburb of Auckland. Given the person's history, these two records didn't seem unusual. However, in February 1989 this species of spider began to appear in an increasing number of localities throughout the wider Auckland metropolitan area. In addition, reports came in from many other cities, spreading virtually the length of the North Island, from Whangarei in the north to Martinborough in the south.

By the end of May 1989, 28 golden orbweavers had been recorded over the last summer season in the North Island. There have been on new records in June or July. Over the same period there were no records from the South Island.

With the infrequency of the *Nephila* genus appearing in New Zealand it has been assumed that all these records over the past two seasons are the same species. They appear to be either *N. edulis* or a very closely related species. Only females have been found, usually by members of the public quite unused to such large spiders. It is by far the largest species of orbweaver found in New Zealand.

Much speculation has surrounded the likely mode of transit of the species to New Zealand. It was assumed the most likely source would have been somewhere in Australia, since *N. edulis* can apparently be quite common on the eastern coastal areas. It is possible that immature spiders were blown across the Tasman Sea and landed in New Zealand. However, the pattern of distribution does not match that seen in other Australian immigrants arriving in New Zealand. In particular, many lepidoptera have been recorded as arriving in coastal parts of New Zealand, particularly Taranaki, West Auckland, Firth of Thames, Wellington-Horowhenua and Nelson.

It seems more likely to some of us that a mature female or a viable egg sac travelled across the Tasman courtesy of modern day transport. It has not gone unnoticed, that most of the records over the last season occurred in cities on the main trunk railway line.

Speculation also surrounds its possible future in New Zealand. Will it be able to survive our winters and thrive? Several spiders have been under observation by entomologists in Auckland and Wellington, both indoors and outdoors. Indications are that the adult females do not survive past June having laid egg sacs in April. A number of egg sacs will receive close observation in the spring. These eggs could be fertile if mating had occurred prior to capture. We await any new arrivals in the spring with trepidation.

by C.J. GREEN per JOHN TENQUIST
NZ Correspondent

OBITUARY

Carl Reinganum (September 11,1931 - May 18,1989)

Carl Reinganum died very suddenly at home on May 18th, 1989. Carl had worked in the Victorian Department of Agriculture and Rural Affairs (DARA) since July 1958, not long after arriving from England, his birthplace, where he had completed a BSc at Bristol University. His first position was at Tatura (The Institute for Irrigation and Salinity Research) where he was employed as a plant pathologist on the peach brown rot research program and in May 1963 he commenced work at The Plant Research Institute, Burnley, in a permanent position also as a plant pathologist.

In 1973, he completed a MSc at Monash University, his research being done on a virus of field crickets. It was in this area of research, the viruses of insects, that Carl developed his main expertise and won considerable world recognition over the last 25 years. He published numerous papers in international journals and contributed a number of book chapters in texts on invertebrate pathology. He had a project supporting virus diagnosis in the honey bee industry and made major contributions to numerous other projects involving viruses of insects such as:

- control of armyworms using a pathogenic virus
- cricket malpighian virus
- Queensland fruit fly virus
- cricket paralysis virus
- diagnosis of a virus disease in the Melbourne Zoo's butterfly house.

Another major area of expertise developed by Carl was electrophoretic identification based on comparisons of isoenzyme patterns. He became a DARA authority in this work and made major contributions to programs such as:

- identification of skeleton weed biotypes
- identification of pathovars of *Septoria ritici* on citrus (a project that could result in major export earnings due to the sales of oranges to the U.S.).
- identification of insecticide resistant races of insect pests in stored wheat
- identification of races of fungi of stripe rust and flag smut in cereals.

More recently Carl had been supervising programs on identification of mycoplasma diseases in crops such as tomato, strawberry, potatoes and ornamentals.

There was also another side of Carl that should be remembered, and that was his deep love of Nature, particularly the rainforests of Queensland and the rest of the world. He was a keen bird watcher and travelled to some far-off exotic places in pursuit of a glimpse of rare species.

Carl was well known and well liked at PRI, especially for his humour and wonderful sense of the ridiculous. He was generous and patient in imparting his scientific skills and knowledge to a range of scientists throughout DARA and the three Victorian Universities.

Carl was a research scientist with a great breadth of skill and knowledge. He will be greatly missed by all his friends and colleagues. He is survived by a twin brother who lives in Sorrento, Italy. With his passing the world will be a little less colourful.

BOB SWARD
Virologist PRI, Burnley

WHAT IS ACIAR?

Many people have now heard of ACIAR, but fewer know what the organisation does. The acronym stands for Australian Centre for International Agricultural Research, yet the Centre is not a research organisation in the normal sense of the name.

ACIAR was established in 1982, as a small and specialized part of Australia's overseas aid program. Australia more than most western nations shares many agricultural features with developing countries - proneness to drought and erosion, deficiencies or other problems in the soils, comparable climates, and so on - and many of the solutions developed here can usefully be shared with developing countries as they conduct their own research on the same topics. ACIAR brings together the Australian and the overseas scientists into a unified project, with the emphasis on transfer of expertise.

The principal scientists are therefore those already working within an institution - government department, university or whatever. ACIAR support may provide assistance at a more junior level to enable the scientists to add the extra international dimension to an already full work load; it also provides research maintenance to run the work, and above all it provides for substantial travel between the countries involved, since it is by working together that the scientists can best learn from each other's expertise. For the most part the scientists each conduct research on the topic in their own laboratories, but the Australian scientists will travel relatively frequently to the overseas laboratories, for several weeks at a time, and the developing country scientists will come to work in the Australian laboratories, sometimes for extended periods.

In many aid programs an expert is sent to a country to solve a problem, and withdrawn again at the end of the work. When a problem next arises the overseas country is not better able to solve it than before, and another expert has to be sent in. The key feature of ACIAR's projects is that scientists at both ends are working on the same topic, sharing results, exchanging thoughts and opinions and generally interacting as colleagues, and it is from this interchange that expertise is transferred. By the end of the project a relationship between colleagues has been built up, which frequently continues thereafter.

Nor is the transfer of benefits only one way, and indeed ACIAR looks to benefits in both directions wherever possible. The Australian scientists may gain an extra dimension from research in a broader context. Different conditions may give insights into solutions not possible within the narrower confines of one country; ideas can be tested on a larger scale overseas because of abundant labour; improved varieties of plants can be exchanged in both directions and so on. Sometimes the Australian gain may be very direct - for example, Australian scientists collaborating with Thai workers on foot and mouth disease have gained practical experience with the disease in Thailand that would be impossible to acquire in Australia for quarantine reasons.

A project may collaborate with more than one developing country at a time, but is subject to a bilateral agreement between Australia and each individual country. The topic must be endorsed by the overseas country as being a priority problem and the project must be officially requested; the topic must also be one on which Australian expertise is available, and the Australian scientists should be actively working in the field. We do not wish to divert Australians from work that they should be doing for Australia - merely to provide support to add a broader dimension.

ACIAR has programs on Crop Sciences, Postharvest (stored products), Animal Sciences, Fisheries, Forestry, Soil Science, Plant Nutrition, Forages, Agricultural Economics and Farming Systems, and Communications. The first two particularly involve entomological research, though other programs may have occasional entomological aspects. Bruce Champ co-ordinates the Postharvest work, Paul Ferrar the Crop Sciences entomological work.

In the next issue I will outline the different facets of entomology that ACIAR supports.

PAUL FERRAR
Research Services Officer, Crop Sciences
ACIAR GPO Box 1571
CANBERRA ACT 2601

John Lawson Collection to the ANIC

The Australian National Insect Collection of CSIRO Division of Entomology, Canberra, has received the late John Lawson's collection. The collection consists mainly of butterflies; more than 2,500 Australian and 900 exotic specimens. There are also some Australian moths, larger Australian beetles and cicadas. Much of the collection consists of material from the Sydney area but there is also a significant proportion from Cape York Peninsula. Many specimens have been reared. All specimens are set and well labelled.

John Langrigg Curwen Lawson was born at Rooty Hill on 11 August 1926. He was educated overseas, eventually attending Sandhurst Military College and returned to Australia in 1947. In his earlier years John was an accomplished ornithologist but later his interest in butterflies overshadowed his interest in birds. He was a likeable man of many interests, including vintage cars, politics and local history. The attic floor of his home was a treasure trove and museum of historical artefacts from the Rooty Hill area. John married Elizabeth, nee Queally, in 1959 and they lived in the historic Rooty Hill Homestead which had long been in the possession of the family. He was an industrial arts teacher for the NSW Department of Education and was skilled in the restoration of furniture and the upkeep of his historic home as well as in the construction of storeboxes for his butterfly collection. During the vacations he used his time for his interests and was particularly fond of guiding overseas visitors to various parts of Australia. John Lawson died in December 1988 at the age of 62.

EBBE S. NIELSEN and TED EDWARDS
ANIC, Canberra

Coming Events

Ecological Society of Australia Open Forum

To be held at University of Wollongong on September 24-27, 1989. Contact: Dr Ros Muston, Zoology Department, University of Wollongong, NSW 2500.

59th ANZAAS Congress

To be held in Hobart on February 14-16, 1990. Theme is "Global Change and the Southwest Pacific". Contact: Dr Peter E. Doe, Department of Civil and Mechanical Engineering, University of Tasmania, Hobart, TAS 7000.

Population Dynamics of Forest Insects

To be held in Edinburgh UK, on September 4-7, 1989. Contact: Dr A. Watt, ITE, Bush Estate, Penicuick, Midlothian, EH26 0QB, United Kingdom.

5th International Congress of Ecology

To be held in Yokohama Japan, on August 23-30, 1990. Contact: Prof Yiuti Cho, c/- Prof Akira Miyawaki, Institute of Environmental Science and Technology, Yokohama National University, Yokohama 240, Japan.

Conservation of Insects and their Habitats

This is the 15th symposium of the Royal Entomological Society of London and will be held at Imperial College, London on September 14-15, 1989. Enquiries to: The Registrar, RESL, 41 Queens Gate, London SW7 5HU, England.

First Asia-Pacific Conference of Entomology

The first of this major new series of entomology conferences will be held in Chiangmai, Thailand, on November 8-13, 1989. Enrolment documents are available from: The Secretariat, First Asia-Pacific Conference of Entomology, PO Box 1078, Bangkok 10903. (Telephone: 662-579-2350, Fax: 662-579-8781.

Systematics and Biogeography of the Austral Biota Ninth Meeting of the Willi Hennig Society Canberra, 24-27 August 1990

The first announcement for this meeting will be available shortly. It provides a tentative list of speakers in the sessions which include: (1) Molecular biology and systematics. (2) The use of phylogenetic information in ecological and evolutionary studies. (3) Austral flora and fauna: systematics and evolution. (4) Austral biogeography. (5) Coevolution of plant and animal groups. (6) Phylogenetic computing software. (7) Poster session.

For more information write to Dr. Ebbe S. Nielsen, CSIRO Division of Entomology, GPO Box 1700, Canberra, ACT 2601, Australia.

21st AGM and Conference of Australian Entomological Society

To be held in Canberra June 30-July 4, 1990. Enrolment form with full details will be included with November issue of MYRMECIA.

3rd International Colloquium on Pest Ants

To be held in Brazil October 9-13, 1989. Contact: J.C. Delabie, CEPLAC, Div. de Zoologia, CP7, 45.600 Itabuna, Bahia, Brazil.

Decision Tools for Pest Management

A residential post-experience course to be held at the Centre for Pest Management, Imperial College, University of London at Silwood Park on the outskirts of London. September 11-22 1989. All inclusive fee £1750. Enrolment forms from: Mrs Pamela Manser, Continuing Education Centre, Room 321, Sherfield Building, London. SW7 2AZ, UK.

Advanced Methods in Medical and Veterinary Vector Control

An intensive residential post-experience course to be held at Imperial College's research laboratories at Silwood Park on the outskirts of London. Organized jointly by the Department of Pure and Applied Biology and the Department of Medical Parasitology. January 29-March 9, 1990. All inclusive fee £3,800. Enquiries re course content to Professor Elizabeth Canning, Imperial College, Silwood Park, Ascot, Berkshire, SL5 7PY, UK. Enrolment enquiries to Director of Continuing Education, Sherfield Building, London, SW7 2AZ, UK.

News from the Conservation Committee

Members of the committee who attended the 20th AGM at Macquarie University in Sydney, Jenny Anderson, Tim New, and Penny Greenslade, held an informal meeting and Penny also met with members of the Executive. Several topics were discussed including the need to decide on a policy of promotion for insect conservation with regard to the rather limited resources of the committee in terms of manpower, time and money. The proposed Charter on invertebrates was also discussed and news this week is that an Australian version of the European Charter on invertebrates has just been adopted by Concom (Council of Nature Conservation Ministers). It is reproduced in full in this issue of MYRMECIA. Barry Richardson of the Bureau of Flora and Fauna was largely responsible for modifying the European Charter and presenting it to Concom.

Other news is that considerable progress has been made, it appears, with our recommendations concerning conservation in the Antarctic and the Australian Antarctic Division is adopting some of them and starting trials of others. More recently the Prime Minister's Statement on the Environment has stimulated considerable action since, even in the full statement, insects have not been mentioned although much play has been made of biodiversity and the endangered species unit in Australian National Parks. Letters will be sent to the relevant bodies stressing the need to consider insects in both these areas.

PENELOPE GREENSLADE,
Convenor, Conservation Committee
c/- CSIRO Division of Entomology
GPO Box 1700
CANBERRA CITY ACT 2601

COUNCIL OF NATURE CONSERVATION MINISTERS AUSTRALIAN STATEMENT ON INVERTEBRATES

1. Invertebrates are the largest component of our fauna, both in number of species and biomass

The number of scientifically identified invertebrate species in the world is well in excess of a million, whereas there are less than 60,000 species of vertebrates. In Australia the invertebrate fauna includes an estimated 100,000 described species and possibly 200,000 undescribed species, while the vertebrate fauna includes approximately 6,000 species.

Invertebrates include microscopic Protozoa (25,000 known species), worms (20,000), molluscs (over 100,000) and arthropods (925,000). The latter group includes spiders (34,000), crustaceans (25,000), millipedes (10,000) and insects (approximately (850,000).

However, it is now believed that the tropical arthropod groups alone may consist of at least 30 million species (including 22 million insect species), or 600 times the total number of vertebrate species. Every year science discovers and describes 15,000 to 20,000 new species of invertebrates.

The greatest single source of animal biomass can be ascribed to soil invertebrates. This may be as much as 1 tonne per hectare, well in excess of the average biomass of vertebrates. This fauna has an enormous potential of which mankind knows and uses only a tiny part, but has destroyed or irreversibly changed this fauna over large areas.

To these terrestrial invertebrates may be added the biomasses of flying invertebrates, and marine invertebrates whose quantity defies calculation. Between 9 and 10 million tonnes of marine invertebrates are fished every year for human food (molluscs and crustaceans).

This huge biomass of terrestrial and aquatic invertebrates consists largely of species which degrade and release primary (plant) and secondary (animal) organic matter, putting it back into circulation for biological use.

2. Invertebrates are an important source of food for other animals

Terrestrial and aquatic invertebrates are the principal source of food for many species of fishes, amphibians, reptiles, birds and mammals. They are, therefore, a basic element in the food chains and networks which underlie the general balance of nature. Their existence and full development are essential for overall biological equilibrium.

3. Invertebrates may also constitute a source of food for mankind

Particularly in tropical regions, arthropods and other invertebrates may constitute a large direct food reserve for mankind, either in normal times or, especially, in times of shortage. Marine and freshwater crustaceans (crabs, lobsters, crayfish, etc.), marine molluscs (mussels, oysters, clams, octopus, cuttlefish, etc.) and terrestrial molluscs (snails) are employed as foodstuffs and sustain considerable farming, harvesting and commercial activity.

Termites, grasshoppers, the larvae of wood beetles and butterflies, and spiders are other invertebrates widely used for human consumption on four continents. Honey, which is produced by insects, is also of great importance as a foodstuff.

4. Invertebrates are vital to nutrient recycling and to the fertilization and growth of the vast majority of cultivated plants

In both temperate zones and tropical climates, invertebrates constitute the dominant part of the terrestrial fauna and are vital to the formation of soil and humus an in keeping them fertile. Invertebrates which bury the carcasses of small animals help in both soil fertility and the cleansing of the environment.

Coral reefs and atolls are formed from invertebrates. The marine invertebrate meiofauna recycles nutrients in the oceans and the importance of these two processes to humanity cannot be overlooked.

Approximately 80% of plants cultivated for the production of fruit and vegetables, textile fibres, medicinal preparations and various other substances are fertilized via invertebrates (especially by bees, but also by many other pollen-bearing insects).

Furthermore, invertebrates are one of the crucial factors in plant productivity through their physical action on soil or their counteraction of processes which restrict soil fertility.

For instance, the effect of earthworms on the soil

stimulates grass growth which is necessary for conserving the soil, rearing domestic animals and preserving wild fauna. Transplanting certain earthworm species from Europe to Australia has improved the productivity of grassland and boosted stock production. Dung beetles break up and consume and excrement of wild and domestic mammals which would otherwise form a layer choking the soil and reducing production.

Since the action of soil invertebrates sustains and encourages vegetation, they are essential to agriculture, forestry and animal husbandry. They enhance the richness and variety of wild fauna, soil conservation and the beauty of the landscape. The regulation of water systems, atmosphere regeneration and the fitness of the environment for habitation are all facilitated by the action of invertebrates.

5. Invertebrates are useful in protecting farming, forestry, animal husbandry, human health and water purity

Biological pest control, which exploits natural patterns of competition between living organisms, is an effective system of defence for limiting damage by harmful animals and plants. For instance, red wood ants, which prey on tree-damaging insects, protect forests and can be mass-produced and transplanted for the purpose of such protection. In Europe they destroy 700,000 tonnes per year of forest insects, the majority of which are harmful.

The outbreak in Australian of the prickly pear cacti, especially of *Opuntia inermis* and *O. stricta*, infested some 24 million hectares. The infestation was eventually controlled by the introduction of the moth *Cactoblastis cactorum*.

The undisturbed presence of invertebrates is fundamental for preserving the purity of surface and groundwaters.

6. Invertebrates are valuable aids for medicine, industry and crafts

Invertebrates may be the source of medicinal preparations: in this respect they are still a poorly known and under-exploited resource. Examples are, the European coleopteran *Paederus fuscipes* which produces pederin, a substance used successfully in homoeopathic doses in the treatment of ulcers, or bee toxin (used in articular diseases), royal jelly, manna and the use of such invertebrates as leeches in certain medical therapy.

Many species play an important part in industry and crafts: silk and beeswax are examples. Earthworms and other species are used in agriculture and for fishing or as protein in fish-farming. Pearls, coral, mother-of-pearl, are used in the manufacture of jewellery and trinkets. Natural sponges are harvested. Some invertebrates are also highly sensitive indicators of environmental quality and can be used to detect low level pollution.

7. Many invertebrates are attractive

Butterflies and dragonflies very often are taken as symbols of beauty and many other invertebrates are of great aesthetic value.

The large number of species and their great morphological variations make invertebrates a major source of inspiration for people of diverse interests.

8. Some invertebrates may harm human activities, but their populations may be controlled naturally by other invertebrates

Periodic outbreaks of certain species of plant-eating invertebrates, especially defoliator insects, may result in major damage to crops and forests. In addition, the harmfulness of certain invertebrates as parasites and in the transmission of diseases to man, domestic animals and cultivated plants is recognized and justified measures for the defence of human interests. Such measures, however, can be implemented in such a way as to respect, as far as possible, the integrity of the environment and of its plant, animal and human components.

Ninety-eight percent of potentially harmful arthropods are, in fact, kept under control by other arthropods which are their predators or parasites. As such they constitute permanent, free and non-polluting natural factors in biological equilibria and biological pest control. The following are examples: ladybirds destroy plant lice and cochineals which are immensely harmful to agricultural crops; parasitic wasps, such as *Neopolycystus* spp., attack eggs of leaf feeding chrysomelid beetles which are responsible for extensive damage to eucalypts; *Trissolcus basilis* is a parasitic microwasp which attacks eggs of green vegetable bugs.

9. Mankind can benefit greatly from enhanced knowledge of invertebrates

In the fields of behavioural studies, biology, medicine, chemistry and physics, invertebrates lend themselves to research. They live in aquatic, terrestrial and aerial environments and may be found on and in animals or plants. They also can be used in educational programs as they demonstrate a remarkable range of physiological and morphological adaptations and behaviour patterns. They often may be easily bred in great quantities and they have little bulk. These qualities have encouraged their use in basic research experiments and in practical applications. The size and range of forms offers the potential for new research to be conducted on a vast scale.

In particular, the known successes achieved by the use of invertebrates rather than pesticides or herbicides to control harmful animals and plants hold out the greatest hopes of further achievements and research in this field and should be encouraged, promoted and given every support. It is also worth noting the case of cave-dwelling animals and their importance when it comes to studying changes in climate and fauna in the different continents; such animals are genuine examples of living fossils.

10. Terrestrial, aquatic and aerial invertebrates should be protected from possible causes of damage, impairment or destruction

Invertebrates provide humanity with important irreplaceable sources of food, work and welfare. Their presence therefore, must be protected and preserved from all causes of damage or destruction or must be promoted by development, e.g. by the reintroduction of suitable species according to the principle approved by the Council of Europe.

The size of the natural invertebrate fauna is diminishing. Many species have either disappeared or are in the process of disappearance because of human actions without mankind ever having been aware of their existence or having studied their characteristics and possible uses.

As the equatorial forests are destroyed at an estimated rate of 160,000 km2 per annum without being replaced, millions of animal species are doomed. Also, in temperate zones, owing to urbanization and other action with a disturbing effect on the land (fertilizers, agriculture, monoculture, consolidation and division of land holdings, deforestation, fires, hydrographical changes, insecticides, weedkillers, pollution, etc.), the wild invertebrate fauna is dwindling constantly and much of it is in danger of extinction. A single example suffices: 50 species or subspecies of butterflies are threatened with extinction out of a total of some 390 Australian species. This situation calls for urgent protective measures.

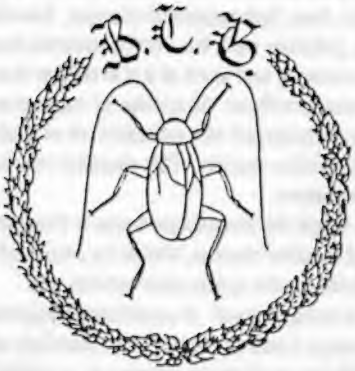
Places where the invertebrate fauna is threatened, or it is of interest for other reasons, should be protected because species cannot survive unless their habitats and environment are preserved. A considerable proportion of the conservation measures to be taken, therefore, will relate to the establishment of nature reserves (e.g. native forests with specific fauna, wetlands where threatened insect species are found, etc.); areas constituting the habitats of invertebrate fauna unique to Australia should be given special priority.

In the fields of spatial planning, urban development, agriculture, forestry, animal husbandry, health, industry, trade and recreation, methods of intervention should be devised which interfere as little as possible with the environment in order to spare wildlife, including invertebrates.

In the fight against those invertebrates which are prejudicial to human interests, preference should be given, wherever possible, to systems of biological control based on natural patterns. Chemical or physical types of intervention must be reduced to a minimum, practised as selectively as possible and entail the adoption of methods which are strictly and solely aimed at the target species and have short-lived effects. Where invertebrates have been exterminated, they should be reintroduced in accordance with the approved principles for the reintroduction of species. In view of their practical value to mankind, research on invertebrates in all branches of science must be encouraged.

NO animal or plant species should be allowed to disappear because of humanity's activities.

THE BLATTODEA CULTURE GROUP



The B.C.G. is an independent group of cockroach enthusiasts formedd in 1986, whose basic aim is to bring into and maintain in culture as many worldwide species of cockroach as possible.

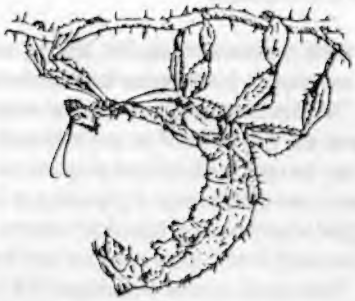
One year's subscription costs £3.00 for both British and overseas members and in return you will receive 3-4 informative Newsletters containing such items as in-depth species reports, a free information pack, access to free livestock of many species of cockroach (including some species only available to group members) and contact with fellow enthusiasts worldwide through regular membership lists.

Prospective members should contact:

G.W. Beccaloni
35A Church Road
Hanwell
LONDON W7 3BD UK

EDITOR'S NOTE: Australian entomologists who may wish to join either the phasmid or cockroach study groups mentioned above will, of course, not be able to import living colonies of cockroaches or phasmids to Australia because of our necessarily strict quarantine laws.

THE PHASMID STUDY GROUP



Since its formation early in 1980, the Phasmid Study Group has expanded to more than 250 members in 16 countries, including people of all ages and ranging from beginners to professional entomologists.

The purpose of the Group is to encourage studies of all aspects of PHASMIDS (STICK and LEAF INSECTS), which are published in a quarterly Newsletter issued free to members. Since phasmids have received little attention until recently, there is scope for anyone to provide new information, and the wide range of members contributes a great variety of articles, with lengths from one line to several pages. A feature of each Newsletter is that one or two species are covered in detail.

Lists of members and species cultured in the Group are sent out on joining, together with any Newsletters already issued in that year. Some back issues are also available.

Prospective members should send their name and address with £5.00 sterling to:

Mr Paul Brock
"Papillon"
40 Thorndike Road
Slough Berks SL2 ISR
England

For Sale

Back Issues of the Proceedings of the Linnean Society of NSW

Back issues of most volumes are available including some rare, leatherbound copies of early volumes. The Proceedings contain papers in all branches of Natural History. Much of the Transactions of the Entomological Society of NSW is available also.

For further information, contact the Secretary, Linnean Society of NSW, PO Box 457, Milsons Point, 2061. Telephone (02) 929 0253) (office open Tuesdays only).

'The role of invertebrates in conservation and biological survey' ed. J.D. Majer (1987), Department of Conservation and Land Management, Perth

Copies of this publication, which contains the papers presented at the conservation workshop of the 18th Entomological Society, AGM, are still available. Anyone wishing to purchase a copy should send $8.00 to Dr J.D. Majer, School of Biology, Curtin University of Technology, PO Box U1987, Perth, 6001. Cheques should be made payable to the 'Australian Entomological Society'.

BOOK NOTICE

"Tasmanian Plecoptera" by H.B.N. Hynes. 81 pp, spiral bound. Published as Special Publication No. 8 by the Australian Society for Limnology.

Comprises a complete systematic treatment of the whole stone fly fauna of Tasmania including a checklist of species, keys to adults and nymphs, and notes on distribution and ecology of all species. Available for $10.00 (including surface postage within Australia and overseas) from:

Dr S.E. Bunn,
Editor, ASL Special Publications
Australian Environmental Studies
Griffith University
NATHAN QLD 4111

CALL FOR NOMINATIONS FOR THE 1990 IAN MACKERRAS MEDAL FOR EXCELLENCE IN ENTOMOLOGY

The Executive invites nominations of Society members for the fourth award of the Ian Mackerras Medal in 1990.

Those wishing to nominate a member for award of the medal should bear in mind that:

(a) Only financial members of the Society who will be under the age of 50 years on 31 December 1989 are eligible for nomination.

(b) A candidate must be nominated by not fewer than two financial members of the Society.

(c) The proposers of a candidate shall provide the Society's Secretary, not later than March 16, 1990, with a detailed statement, including the candidate's name, date of birth, academic distinctions, relevant appointments and membership of Societies, together with a list of his or her more important publications. In addition, a statement should be made, in not more than 500 words, why the candidate merits this distinction in entomology.

(d) A Selection Panel for award of the medal will be appointed and convened by the President, and members of that panel shall themselves not be elegible for nomination, nor may they be signatories to a nomination.

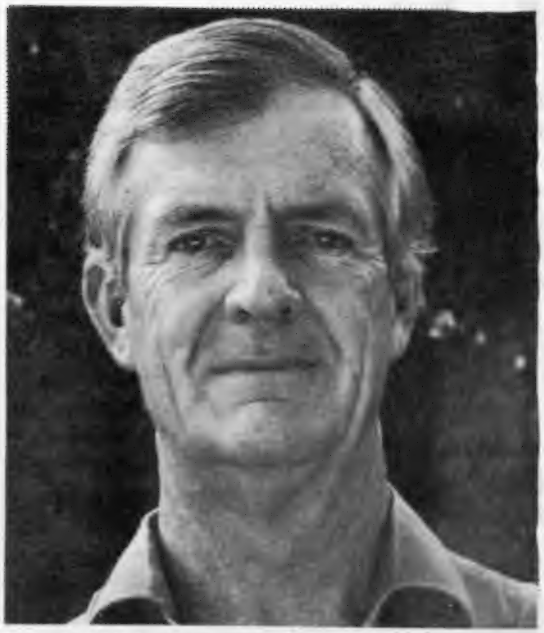
(e) Should the panel recommend to the Executive that an award be made, the name of the recipient will be announced at the 21st AGM in Canberra in June/July 1990 and, if possible, the medal will be presented to the recipient at that meeting.

Previous recipients of the Mackerras Medal are Dr J.A.L.Watson (1984), Dr R.W.Sutherst (1986) and Dr T.R.New (1988).

RESEARCH REQUEST

The following request for research material has been received from Dr Liang Aiping, Department of Entomology, Institute of Zoology, Academia Sinica, Zhongguancun, Haidian, Beijing 100080, Peoples Republic of China. Please communicate directly with Dr Liang:

"I am now revising the Austro-Oriental genus *Philagra* (Homoptera: Cercopoidea: Aphrophoridae). This genus may be recognized by the fact that the head is conically produced in front of the eyes into a cephalic process as long as or shorter or longer than the pronotum and scutellum combined, usually sloping dorsad. This is a fairly large genus with its members distributed over the Austro-Oriental region, mainly, however in the Orient. Five species have been recorded from Queensland, viz. *Philagra concolor* Hacker, *P. fulvida* Hacker, *P. hastata* Walker, *P. parva* Donovan and *P. recurva* Jacobi. I would be most interested in examining Australian material of the genus, including types, identified and unidentified specimens. I can assure that all rerasonable care will be taken of specimens from your collection and that they will be returned by the date specified." (A species of *Philagra* is illustrated on p.411 of *Insects of Australia* - Ed)



Professor Hugh Paterson

LINNEAN SOCIETY HONOURS

In the year of its 200th Anniversary the venerable Linnean Society of London has bestowed honours on two Australian entomologists in the form of invited membership. Professor Hugh Paterson, Head of the Entomology Department at the University of Queensland, has been elected to Foreign Membership, an honorary category limited to 50 members worldwide at any one time. Hugh is well known for his iconoclastic contributions to evolutionary theory. Dr Richard Drew, Supervising Entomologist in the Queensland Department of Primary Industries, has been invited to become a Fellow of the Linnean Society. Dick's reputation stems from his prodigious output of work on the systematics and ecology of dacine fruitflies in Australia, the Pacific and Southeast Asia.

Dr. Richard Drew

CHANGES TO LISTINGS OF C.I.T.E.S. BUTTERFLIES

C.I.T.E.S. stands for the Convention on International Trade in Endangered Species, an international agreement between signatory countries aimed at curbing illegal trade in species of animals and plants which are deemed to be endangered. Australia became a signatory to CITES in 1976 and today about 100 countries are participants to the Convention.

CITES basically operates by specifying two lists of species which are prohibited items of non-scientific traffic across the borders (in or out) of signatory countries. The two lists are called Appendix I and Appendix II with administrative controls on trade in species on Appendix I being tighter than those on Appendix II. Species on Appendix I are regarded as being endangered at present while those on Appendix II are considered to be likely to become endangered if trade in them is not curtailed.

When Australia first signed CITES the only terrestrial arthropods entered on the Appendices were certain swallowtail butterflies, viz. *Parnassius apollo* and "Birdwing" butterflies of the genera *Ornithoptera*, *Trogonoptera* and *Troides (sensu* D'Abrera), and all these were Appendix II species. The only Australian species which fell into this category were our two birdwings *Ornithoptera priamus* and *O. richmondia.*

At a Conference of the Parties to CITES held in Ottawa in July 1987 certain changes were made to the CITES listings of insects. In addition, a spider was added to the list. Members contemplating any overseas exchanges or other traffic in these groups should notes the changes. The present Appendix entries are as follows:

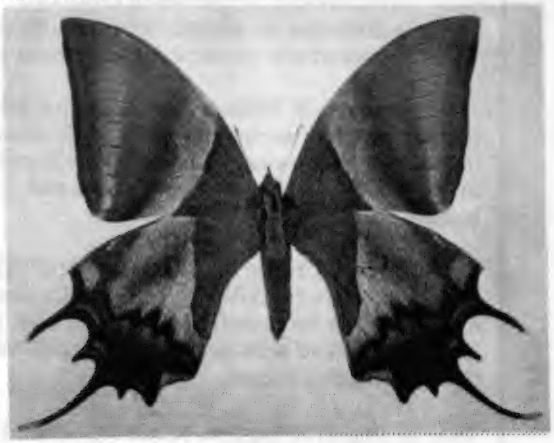
APPENDIX I:

Ornithoptera alexandrae	Queen Alexandra Birdwing
Papilio chikae	Luzon Swallowtail
Papilio homerus	Homerus Swallowtail
Papilio hospiton	Corsican Swallowtail

APPENDIX II:

Ornithoptera spp.	Birdwings
Troides spp.	Birdwings
Trogonoptera spp.	Birdwings
Parnassius apollo	Apollow Swallowtail
Teinopalpus spp.	Kaiser-i-Hinds
Bhutanitis spp.	Bhutanitis swallowtails
Brachypelma smithi	Red-kneed Tarantula

Bhutanitis ludlowi



Teinopalpus imperialis

New edition

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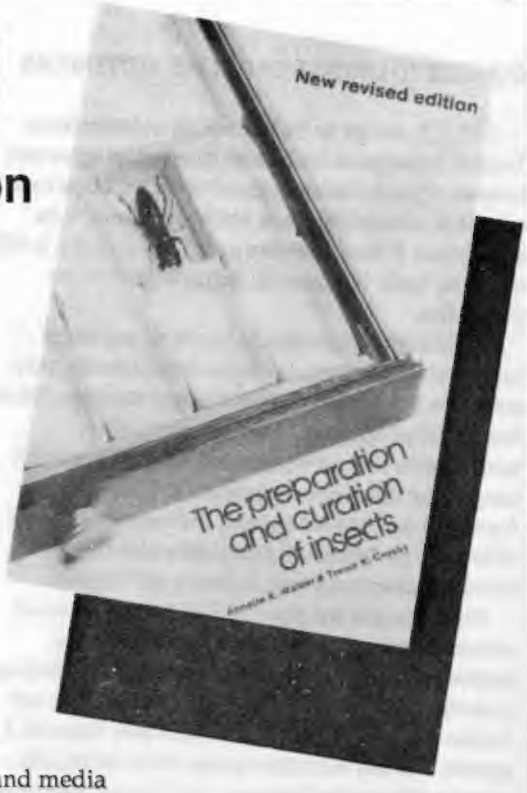
Annette K. Walker and Trevor K. Crosby



The completely revised second edition of this popular work sets out methods and techniques recommended by the curator of the New Zealand Arthropod Collection (NZAC). It also discusses the management of insect collections. In response to requests and suggestions from colleagues, the authors have extensively revised the 1979 edition, adding illustrations, providing more detailed explanations of methods and techniques, and describing alternatives for many. Three new sections have been added:

- hazardous properties of chemicals
- formulae for various solutions, fixatives, and media
- procedures for sending specimens to be identified.

Annette K. Walker worked with the NZAC for 15 years; for the last 2 years she has worked as a hymenopterist with the Commonwealth Agricultural Bureaux, International Institute of Entomology, London. Her 25 publications include 2 co-authored contributions in the "Fauna of New Zealand" series and 2 popular books in the "Mobile New Zealand Nature Series".

Trevor Crosby has been curator of NZAC for the last 12 years; his research concentrates on blackflies (sandflies). Dr Crosby has written some 40 scientific publications; a recent paper he co-authored showed how insects could be used to prove cannabis importation, and was awarded the Philip Allen Memorial Award for 1987 by the Forensic Society of Great Britian.

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21st AGM AND SCIENTIFIC CONFERENCE
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The topics include insect transformation, vectors for change, strategic genes, insecticide resistance, molecular pathology, and species identification. Contact Joanne Daly and Marion Healy (062)465349

Evolutionary Ecology

Contributed papers are invited in the areas of life history tactics, optimal foraging, host and habitat selection, optimal behaviour sequences and decision making, sociality, sex ratio, sexual selection and mating. Contact Paul Wellings (062)465680

CONTRIBUTED SESSIONS

Applied taxonomy, post-harvest entomology, *Heliothis* biology, aquatic entomology, applied entomology and general entomology.

SOCIAL EVENTS

An evening at the National Science and Technology Centre
A reception at parliament house
Annual Dinner
Excursion to temperate rainforest

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